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Original Communications.

*ON THE TREATMENT OF AFFECTIONS OF THE STOMACH.**

LECTURE I.—HISTORICAL CONSIDERATIONS ON DISEASES OF THE STOMACH AND THEIR TREATMENT.

By Professor Dujardin-Beaumetz,† Paris, France.

GENTLEMEN:—I desire to devote my lectures on "Clinical Therapeutics" this year to the study of the treatment of affections of the stomach. This is a subject which has interested me not a little for many years, and I shall endeavor to state as briefly as possible on what bases your treatment should henceforth rest, and what are the new methods which you should follow in order to attain not only to the diagnosis but also to the prognosis of these affections.

By the importance which should be assigned to hygienic measures, and particularly to diet in the treatment of these affections, this study will be a complement to the lectures on "Alimentary Hygiene," "Hygienic Therapeutics," and "Prophylactic Hygiene," which I have already delivered in this amphitheatre, and I hope that you will derive from these instructions some

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profit which will benefit you in your daily practice.

It may be said that it is only in the last twenty years that the study of the affections of the stomach has taken a truly scientific development. Do I mean by this to imply that physicians formerly did not know how to treat such affections? Not at all. But ignorant of the minute methods of examination of the digestive process, physicians of former times did not possess exact knowledge respecting the chemical changes which the food undergoes, and the modifications which pathological states impose on the digestive act.

The ancients, in particular, had been struck by the relation which exists between nutrition and the integrity of the digestive functions. Thus Hippocrates has left an aphorism which might serve as a motto for all our treatises on affections of the stomach; it is as follows: "What the soil is to the trees, the stomach is to animals." And further on he adds: "As a new cask leaks and an old one retains its contents, so the stomach transmits its nourishment, but retains the recrements."*

Another point which had engaged the attention of the ancients was the relation which seems to exist between certain nervous disorders and the troubles of the stomach. So they assigned to the hypochondriac regions the source of all these nervous ailments, and gave them the generic name of *hypochondriases.*

Read the following passage of Hippocrates, and you will be struck by the similarity which exists between this description and the neurasthenic states which we to-day associate with dilatation of the stomach: "Those who are affected with this malady (hypochondriasis) necessarily eat, and yet cannot bear the food which they take; their entrails make gurgling noises, and the orifice of their stomachs is the seat of pain. They vomit sometimes one sort of humor, sometimes another; they throw up bile, saliva, pituita, acrid matters, and, after having vomited, they seem to themselves to be better; but when they have again taken nourishment, they go through another course of belchings and eructations; they have headache, they feel prickling sensations over the whole body, sometimes in one part, sometimes in another, as though some one were pricking them with pins. This disease never leaves till old age, unless the patient dies from it before old age arrives" (*De Morbis*).

* "Works of Hippocrates," translated by J. R. Coxe. Philadelphia, 1846.

Galen, who was the medical authority of the whole world down to the seventeenth century, devotes an entire chapter to the affections of the stomach, and he repeatedly insists on the sympathy which exists between certain nervous symptoms and the disorders of the stomach. "There are persons," he says, "who are not only taken with syncope starting from the orifice of the stomach, as well as from the heart, but who also have attacks of spasm, carus (*sopor caroticus*, the last degree of sopor), epilepsy, and melancholia, due to abnormal states of this orifice." Then he cites the interesting case of a young grammarian who was an epileptic, and the study of whose symptoms led him to think that his epileptic fits depended on troubles of the stomach; and this is the treatment which he prescribed: "I ordered him to devote his entire care to obtaining a healthy and regular digestion; to eat at the third or fourth hour (10 A.M.) a little bread well baked and wholesome, and without any drink, if he were not thirsty; if thirsty, to take a little water with a slightly astringent white wine, for these wines fortify the stomach and do not go to the head like the strong wines; and with such a diet he got the better of his fits." This method of treatment resembles in many points, as you see, that which we prescribe for dilatations of the stomach.

Moreover, this entire chapter of Galen furnishes material for meditation. It shows that all parts of the stomach may be the point of departure of nervous troubles, and this is the way the chapter ends: "Everybody knows that the act of coction (digestion) is accomplished in all parts situated below the orifice (cardia), so that this orifice, if its conformation be bad, becomes the cause of bad coction, when this latter does not result already from the disordered digestion of aliments of bad quality, or taken in excessive quantity."

It was on such data that medicine for ages was based, and we must come down to the sixteenth century before we see developing the first elements of a science which was destined profoundly to modify the views of the medical profession on diseases of the stomach. I refer to pathological anatomy.

Thus we note that a Florentine physician, Benivieni, abandoning the exclusive tradition of Hippocrates and Galen, published the curious observations which his practice furnished, and in a work issued in 1507, five years after his death, entitled "*De abditis nonnulis ac mirandis morborum et sanationum*

causis" (concerning some hitherto unknown and strange causes of diseases, etc.), we find a very marked case of cancer of the stomach.

But we must come down to the beginning of the eighteenth century, to Morgagni, before we have exact and precise notions as to the pathological anatomy of the stomach-affections. The physician of Forli completed the data which, almost a century before, a Genevan physician, Bonet, had compiled in his "Sepulcretum." We find in his letters numerous observations of cancer of the stomach.

At the same time that these anatomo-pathological researches were accumulating in special memoirs, there was introduced into the pathology of stomach diseases a word which was destined soon to include under its generic signification the greater number of affections of the stomach. I refer to the word *dyspepsia*, which, according to certain writers, originated with a physician of the sixteenth century, Jean de Boris. Physicians were then in the habit of using terms which were expressive of the same functional troubles, such as *bradypepsia* and *apepsia*, and you will recall to mind all the threats, which, in the "Malade Imaginaire," Purgon hurls at Argan for not following his prescriptions:

Purgon.—And I mean that before four days you shall be in an incurable state.
Argan.—Ah! pitiful heavens!
Purgon.—That you shall fall into bradypepsia.
Argan.—Monsieur Purgon!
Purgon.—From bradypepsia into dyspepsia.
Argan.—Monsieur Purgon!
Purgon.—From dyspepsia into apepsia.

But it was Cullen who, about the middle of the eighteenth century, carried furthest this extension of the word dyspepsia to all the affections of the stomach, by creating essential, symptomatic, and sympathetic dyspepsias.

If the pathology of the stomach was better understood, equal advance was not made in the treatment, which was even less rational than it was in the time of Galen, and the therapeutic management of affections of the stomach was too much abandoned to the grossest empiricism.

A reformer, who for a time produced a veritable revolution in the treatment of diseases, called anew the attention of the profession to the *rôle* of the digestive functions—I refer to Broussais. Broussais held that the stomach presides over all diseases, and he gave to his dogma the name of *physiological doctrine*. This systematic doctrine affirms that the majority of diseases depend on a gastro-enteritis; and that you may judge how far were carried the views of this over-zealous reformer, who then treated all these gastro-enterites by the antiphlogistic method, it will be sufficient for me to quote the following passage from one of his writings: "Syphilis is an irritation, and you may prevent its repeated assaults, which constitute the diathesis, by attacking it by means of local antiphlogistics, and especially by leeches."*

If, in fact, inflammation is, as Broussais taught, the grand factor which dominates pathology, blood-letting is the most efficacious means with which to oppose inflammation, and all therapeutics is summed up in the employment of antiphlogistics.

The doctrines of the reformer of Val de Grâce (as he was called) had a great vogue, and his son† thus describes the enthusiasm which attended their promulgation: "Broussais owed to no one but himself the elevated place which he so long occupied in science. Beginning his career as a soldier in medicine, he made himself, by the force of his genius, emperor, and from that throne, won by conquest and defended by battle, he promulgated those great truths which have revolutionized medicine."

But at the time of his death, which took place November 17, 1838, Broussais already saw his audience becoming smaller and smaller and his doctrine neglected. The clinical school, conducted by Andral, Louis, and Chomel, had indicated all the dangers attending the systematic medication of Broussais; and in what concerns us particularly, Chomel had shown on what basis should henceforth be established the treatment of the dyspepsias.

These authorities, in fact, included under this name of dyspepsia all the functional troubles of the stomach which do not manifest themselves to the eye of the observer by macroscopic lesions; and their followers soon passed over to the opposite extreme, and this, notwithstanding the reserves which Chomel had formulated in his Introduction and elsewhere:‡ "What I have said concerning the extreme frequency of dyspepsia will lead some to ask, if, after having constantly fought Broussais's system, I have not attained to views not altogether dissimilar to his, as he

* Broussais, "Examen des Doctrines," t. i.

† Casmir Broussais, "Treatise on Irritation," etc., 3d ed., p. 13.

‡ Chomel, "Des Dyspepsies." Paris, 1857.

himself saw gastritis or enteritis in almost all acute and chronic diseases."* Chomel cleared himself of this imputation by showing that he had no pretensions to act the part of reformer, and that he was concerned only with the dyspepsias called essential.

However, ten years later, in 1866, Beau overpassed the prudent limits imposed by Chomel, and spoke of dyspepsia as the origin of a great number of affections, and cancer in particular. He calls these the secondary and tertiary accidents of dyspepsia.

Nevertheless, with the progress of science, this word *essential* dyspepsia is destined to disappear from pathology. It, in fact, but conceals our ignorance, and when we become better informed by pathological anatomy, which is making progress every day, and when we are better enlightened as to the vicious fermentations of which the stomach is the seat, we shall be able to give to each one of those affections which are grouped under the name of essential dyspepsia a particular denomination, which will enable us to classify it among the diseases with known material lesions.

About the same time that Chomel published his work, which was the crowning achievement of his career (for he died a year later, in 1858), Corvisart, in 1854, introduced pepsin into therapeutics, a substance discovered in 1836 by Schwann and isolated in 1839 by Wassmann, and this discovery gave a new impetus to the study of the chemical acts of digestion.

Unfortunately, the experimental investigation of the digestive processes presented great difficulties. To carry them on, physiologists had no better means than the establishment of gastric fistulæ in animals, and these are very difficult to make. They had, indeed, been able to avail themselves of certain pathological fistulæ in man, but such cases were very rare, and Beaumont alone, in 1833, with his Canadian Alexis St. Martin, had obtained therefrom observations useful to physiology and therapeutics.

Physiologists had abandoned the method of Spallanzani, who, about a hundred years before, had taught the method of studying the modifications which take place in the stomach by introducing tubes containing various alimentary substances.

It is to Kussmaul that we are chiefly indebted for better means of investigation, for by applying the siphon to the treatment of affections of the stomach, he taught us how, from a clinical stand-point, to study the divers modifications which are effected in the stomach both of the well man and of the sick man.

Hence, from the time of the communication of Kussmaul, made to the Congress of German Physicians at Frankfort-on-the-Main, we have seen researches on the chemical acts of digestion multiply, owing to the employment of the stomach-pump, and our *confrères* beyond the Rhine have manifested a zeal in this direction which exceeds ours; and you will not fail to remark, by the developments which are to follow, how numerous and how important are their labors. But I must call your attention especially to those of Leube and Ewald.

According to this German school, of which Professor Germain Sée has shown himself the most zealous partisan and exponent, all the dyspeptic troubles must be referred to disturbances in the chemical acts of digestion, and Professor Sée has gone so far as to declare that "the gastro-intestinal dyspepsias are defective chemical operations."†

But along with these means, which are now put in operation in Germany, for the study, in a truly clinical manner, of the modifications which the gastric juice undergoes under the influence of pathological states, we find coming into prominence another doctrine, based especially on those clinical studies which have always made the success of our medical teaching; and Professor Bouchard, in 1884, showed us the important *rôle* which in a great number of affections belongs to dilatation of the stomach.‡ These clinical researches found in the discoveries of Armand Gautier on the ptomaïnes and leucomaïnes a striking confirmation; and Bouchard, taking for his stand-point these new doctrines, and basing himself on the great microbial discoveries of Pasteur and his pupils, has established the foundations of medical antisepsis, and, in particular, of gastro-intestinal antisepsis.

Thanks to these new methods,—the chemical and clinical study of the gastric juice, on the one hand, and, on the other, that of dilatation of the stomach and the knowledge which we have acquired of intestinal antisep-

* Chomel, *loc. cit.*, p. 5.

† G. Sée, "Des Dyspepsies Gastro-Intestinales," Introduction, p. 5. Paris, 1881.

‡ Bouchard, "On the Pathogenetic Rôle of Dilatation of the Stomach, and the Clinical Relations of this Disease with Divers Morbid States" (*Soc. Méd. des Hôp.*, June 13, 1881).

sis,—we are enabled to-day to make a new departure in the treatment of the stomachal affections. This will be the subject of my next conference, and I will begin by the study of the modification of the gastric juice, and of the means which the clinician may employ for the prosecution of this study.

A RESEARCH TO DETERMINE THE ACTION OF NITROUS OXIDE, NITROGEN, OXYGEN, AND CARBONIC ACID UPON THE CIRCULATION,

WITH ESPECIAL REFERENCE TO NITROUS OXIDE ANÆSTHESIA.

By H. C. Wood, M.D., assisted by David Cerna, M.D., Philadelphia, Pa.

Part I.

THE knowledge that we have of the physiological action of nitrous oxide indicates that it has no inherent anæsthetic properties, but that the loss of consciousness which follows its inhalation is the result of asphyxia. The arguments of this view are given in detail in Dr. H. C. Wood's "Treatise on Therapeutics," but may be summed up in a few sentences.

There not only is no proof that nitrous oxide has the power of yielding oxygen to the tissues of the body, but our present knowledge indicates that it escapes from the body unchanged.

Jolyet and Blanche, Elihu Thompson, and other investigators assert, as the results of experimental observations, *first*, that animals live no longer in an atmosphere of pure nitrous oxide than they do in one of nitrogen; *second*, that inhalations of pure nitrogen gas produce symptoms similar to those of nitrous oxide narcosis; *third*, that the introduction of oxygen makes nitrous oxide entirely capable of supporting life indefinitely.

The experiments of Jolyet and Blanche indicate that the phenomena which are produced by the inhalation of nitrous oxide are not due to any accumulation of carbonic acid in the blood, but to the deprivation of oxygen, which, *a priori*, would seem to be logically inevitable, since the inhalation of nitrous oxide stops the formation of carbonic acid by cutting off the supply of oxygen; but, so far as our present knowledge goes, has no effect upon the throwing off of carbonic acid.

The French experimenters just named, in their analyses of the gases of the blood during nitrous oxide anæsthesia, found that there was less carbonic acid at the time when the animal was unconscious than when it was conscious, but that coma did not develop until the oxygen in the blood was reduced to three-fourths per cent. This result in turn was confirmed by the experiments of Dr. Amory, who found that immediately after the recovery of consciousness from nitrous oxide narcosis, less than one-third the normal amount of carbonic acid was given off from the lungs. When to these various facts is added the statement, based upon personal experiment of Dr. MacMunn, that the arterial blood of the animal killed by nitrous oxide affords only spectrum lines of reduced hæmoglobin, the nature of nitrous oxide anæsthesia seems to be well established.

The assertion of Krishaber, however, that the circulation is affected very differently by the inhalation of nitrous oxide by mechanical asphyxia, seems to be contradictory to the other evidence, and has led the authors of the present paper to make an investigation of the subject.

Our first experiments were directed especially to a study of the changes in the pulse and blood-pressure produced by the inhalation of pure nitrous oxide. In discussing the experimental results obtained with nitrous oxide gas, we shall direct the attention of the reader, *first*, to the time which elapsed between the commencement of the inhalation and the development of complete anæsthesia; *second*, to the effect of the drug upon the rate and character of the pulse; *third*, to its influence upon the blood-pressure.

Anæsthesia.—The test which we employed to determine the presence of complete anæsthesia was the conjunctival reflex. When this was completely abolished, the animal was said to be completely anæsthetized. There were so many matters to be attended to in detail in these experiments, that it is entirely possible that in some cases the corneal reflexes may have been abolished a few seconds before a note of their non-existence was taken by us. It is certain, however, that in no case were the reflexes noted as abolished before they were completely gone. It is, therefore, very possible, indeed probable, that some of our periods are too long, but it is not possible that any of them are too short. The length of time which we found to elapse between the commencement of inhalation and anæsthesia varied from fifty-one seconds to three minutes and fifty seconds. In three out of the seven inhalations it was less than two minutes; in only one inhalation did

it distinctly exceed two and a half minutes. The average period was two minutes and eight seconds.

Pulse.—In our first experiment (Experiment 1) the inhalation of nitrous oxide was immediately followed by an enormous rise of the arterial pressure, associated with great disturbance of the pulse; the heart-beats became very irregular, with long diastolic pauses, some of them lasting several seconds, followed by a number of very rapid pulse-beats.

The animal (dog) was allowed to recover consciousness completely, and several minutes later the second inhalation was begun. Owing to a slipping of the canula there had been some loss of blood from the arterial system. The pulse-rate was 144 a minute; in ten seconds it fell to 108 a minute; in ten seconds more to 96 a minute. Then it began to rise, reaching, in the course of twenty seconds, 120 a minute, at which point it stayed until the gas was withdrawn.

In Experiment 2 the pulse-rate was slightly slowed, almost directly after the inhalation, but a pronounced descent did not take place until nearly one minute had elapsed, when the pulse rapidly fell to about one-third of its original number, with heart-beats which were most extraordinary in their power and in the size of the wave which they gave rise to. At the same time, when anæsthesia was noted as complete, the pulse was about 60 beats to the minute slower than it had been originally. It continued to fall, and fifty seconds later was below one-half its norm. Respiration at this time had become very distant and irregular. After the respirations had entirely ceased, and the animal, so far as respiration was concerned, was dead, the pulse-rate was about one-half of what it had been. The pulse-waves were two or three times as large as before the inhalation, this, too, although the arterial pressure had fallen almost to zero. The second inhalation in this experiment was made four or five minutes after the animal had regained complete consciousness from the previous inhalation. The pulse was at this time slowed to 108 a minute; but, nevertheless, while under the influence of the gas, fell steadily, being only 60 a minute at the time the respirations had been so reduced in number that they only recurred at intervals of ten to fifteen seconds.

In Experiment 3 the phenomena of the pulse were similar to those of Experiment 2, the pulse-rate falling at first very slowly and afterwards very rapidly, so that at the end of one minute and forty seconds it was less than one-half of what it had been. It then rose temporarily, but at the time when artificial respiration became necessary to keep the animal alive, it had fallen considerably below one-half the rate it previously had been.

In Experiment 4 the pulse kept at about the rate it was before the inhalation for about a minute and a half, when it began to fall in a peculiar, very irregular way, and at the time of complete anæsthesia it was a little under one-half of its normal number, and though it varied after this somewhat in the rapidity of its beat, by the time the respiratory centres were so paralyzed that it was necessary to supply artificial respiration to restore the animal, the pulse-beat was 60 a minute. When the pulse had become this slow, the size of the individual pulse-wave was enormous,—seven or eight times its original size. The second inhalation was made some minutes after the complete restoration of the animal to consciousness. It was followed after thirty seconds by a decided fall in the rate of the pulse, and at the end of a minute the pulse was only one-half what it had originally been. When anæsthesia was complete, the pulse was considerably under one-half of its normal in frequency. This inhalation was kept up until death, and although at the last the pulse became distinctly much more frequent, it never reached a rate equal to the norm; a few seconds before death, when the arterial pressure was less than half its original height, the pulse-wave was twice as large as the norm.

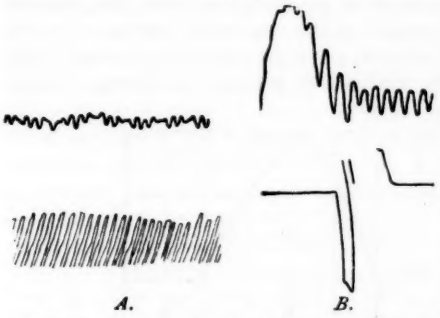
In their general results, so far as the effect of the inhalation of the nitrous oxide upon the pulse is concerned, the experiments which we have detailed are concordant. In one instance there was a stormy irregularity of pulse, but usually under the influence of the gas the pulse falls very decidedly in number, while the individual pulse-beat or arterial wave is enormously increased in size.

In order to show clearly this peculiar pulse change, we append here tracings taken from one of our experiments, showing the highest size of the pulse-wave before inhalation and its size during a portion of the period of anæsthesia. (See Fig. 1.)

In order to determine whether the slowing of the pulse caused by nitrous oxide is due to an action upon the inhibitory centres, the gas was given to a dog whose vagi had been previously divided. Before the inhalation the pulse ranged from 150 to 160; five seconds after the inhalation it was 165; fifteen seconds after this it was 200. Shortly after this the animal had such severe convulsive struggles that the

tracing is excessively irregular, but in about forty seconds more, or a minute after the inhalation had been entered upon, the pulse was 241 a minute. Half a minute later it was 204, half a

FIG. 1.



EXPERIMENT 4.—*A*, tracing before inhalation. *B*, tracing when animal was profoundly anæsthetized and respirations reduced to 7 to 10 a minute. Tracing shows second marks; respiration, abscissa line.

minute later 228, one minute later 180, and thus it continued above the original point until the death of the animal. Throughout the whole course of this experiment the pulse-wave was exceedingly small.

This experiment shows that the slow, huge pulse, so characteristic of the action of nitrous oxide gas, is absent when the pneumogastrics have been previously divided, and that it is, therefore, due to stimulation of the inhibitory cardiac apparatus.

Blood-Pressure.—The effect of the inhalation of nitrous oxide on the blood pressure varied somewhat in the different experiments.

In Experiment 1, in both the first and second inhalations, there was an immediate and enormous rise of the blood-pressure, this rise amounting in the first inhalation to one hundred and twenty millimetres in one minute and twenty-two seconds after the commencement of the inhalation. In the second inhalation, the rise in a minute and twenty seconds was about sixty millimetres.

In Experiment 2 the blood-pressure went up moderately,—that is, about ten millimetres in twenty seconds,—and maintained itself at this position for about a minute, when it commenced to fall, getting below the norm, but recovering itself, so that by the time the anæsthesia was complete the blood-pressure was the same as in the commencement of the experiment. The continued inhalation of the gas was followed by a steady fall in the arterial pressure, which was almost at zero. Artificial respiration was used to resuscitate the animal, which had long ceased to breathe. The second inhalation produced alterations in the circulation similar to but much less pronounced than those of the first experiment. There was a slight rise of pressure, followed by a fall, so that the blood-pressure was below the norm when the conjunctival reflexes were first noticed to be abolished. After this there was a remarkable rise in the pressure, which did not, however, quite reach the norm, and, after a time, fell again, until it was near the zero point.

In Experiment 3 the blood-pressure rose very slightly,—that is, four millimetres after the inhalation had commenced,—and kept at about this point for half a minute longer, when it commenced to fall, and when the conjunctival reflexes were noted to be abolished the arterial pressure was twenty millimetres below the norm. From this point it fell, with occasional momentary rises, until artificial respiration was resorted to to restore the animal, at which time the pressure was about fifty-five millimetres below the original.

In Experiment 4 the inhalation was followed by a rise at the end of one minute of about twenty millimetres. The blood-pressure continued to increase with occasional fluctuations, so that by the time anæsthesia was complete it was about sixty millimetres above the norm. It then commenced to fall, but when the gas was removed and artificial respiration employed, was still far above zero.

In the second inhalation there was a rise in one and a quarter minutes of about thirty centimetres; the blood-pressure after this steadily increased, so that by the time the conjunctival reflexes were noted to be abolished the pressure was eighty centimetres above the norm. After this it fell, with occasional paroxysms of rising until about a minute before death, when it commenced to fall very rapidly and steadily towards zero.

In Experiment 5 the arterial pressure rose after the inhalation about thirty centimetres, and then very slowly fell.

The extraordinary rise in arterial pressure which took place in some of our experiments during the inhalation of nitrous oxide gas has an important bearing upon practical medicine.

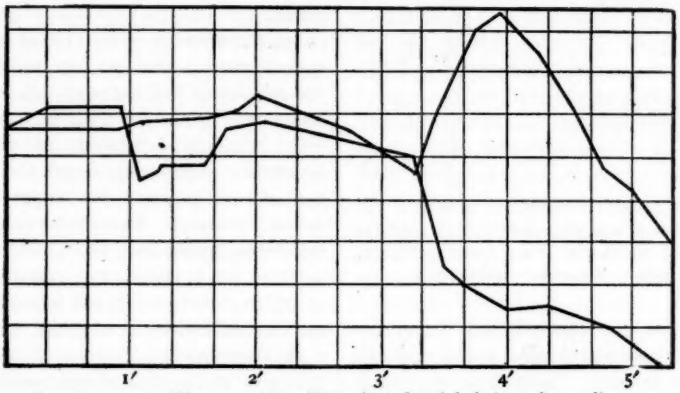
Some time since a death from apoplexy occurred in Philadelphia, directly after the inhalation of nitrous oxide, and it is well known that Dr. Lafont, of France, has asserted that occasionally diabetes mellitus and albuminuria have been produced by the anæsthetic use of nitrous oxide. It is entirely conceivable that in a man with atheromatous or otherwise dis-

eased arteries the inhalation of the gas might cause a rise in the arterial pressure which should produce rupture of smaller or larger vessels, and cause serious symptoms.

In order to portray the effects of nitrous oxide upon the blood-pressure, we have prepared the series of curves which we herewith append, each curve representing the line of average blood-pressure of a single continuous inhalation.

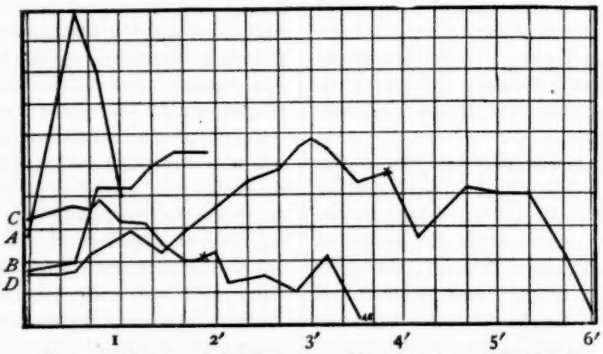
the blood-pressure finally began to fall, and at last reached the zero line; always, however, the pressure was well maintained until long after the complete cessation of respiration, the animal dying through the respiration and not through the heart. Indeed, the maintenance of the circulation after the practical paralysis of the respiratory system is very remarkable. It is also of very great importance in relation with practical medicine. Chloro-

FIG. 2.



EXPERIMENT 2.—Nitrous oxide. Upper line, first inhalation; lower line, second inhalation.

FIG. 3.



NITROUS OXIDE.—Arterial pressure. Experiment 1: *A*, first inhalation; *B*, second inhalation. *C*, Experiment 3. *D*, Experiment 4.

An examination of the diagrams will show, what is revealed even more clearly by our original tracings, that after the inhalation of nitrous oxide gas there is almost always a rise in the arterial pressure, which rise varies very greatly in its extent, as well as in the rapidity of its occurrence. Sometimes it is immediate and excessive; usually, however, it is slowly produced and only moderate in extent. In some cases it occurs a considerable time before the abolition of the conjunctival reflexes, while occasionally its coming on is postponed until after the disappearance of the eye reflexes. In all our experiments, if the inhalation continued,

form directly depresses the heart, and even ether has a similar influence when it is in excess, but nitrous oxide would appear, directly or indirectly, to stimulate the heart and to keep up this stimulation at a time when the respiratory function is almost completely obliterated. A lost respiratory function can be temporarily replaced by artificial respiration, but we have no substitute at all for an arrested heart. It is easy to see why death has so very rarely occurred during anæsthesia from nitrous oxide.

In order to determine whether the rise of arterial pressure produced by nitrous oxide be

due to vaso-motor spasm or not, one experiment was made upon an animal (Experiment 6) whose spinal cord had been divided above the origin of the splanchnic nerves. The result of the inhalation of the nitrous oxide was an immediate and very pronounced fall in the arterial pressure. This would seem to indicate that the rise of the arterial pressure usually caused by the gas is due to vaso-motor spasm, but undoubtedly such spasm is accompanied by a very pronounced increase in the force of the heart's beat. To determine whether the fall of the arterial pressure, which occurs late in the inhalation, is due to vaso-motor paralysis or not, a very powerful current was applied to the sciatic nerve of the animal (Experiment 7), whose arterial pressure had fallen, under the influence of the nitrous oxide, from 138 to 120. After ten seconds of application of the current, the pressure was 109. About half a minute later the arterial pressure was 110, and when the current had been applied about twenty seconds the arterial pressure stood at 103. The faradization of the nerve was always accompanied by a violent tetanic spasm of the tributary muscles, showing that at least the motor fibres of the nerve were capable of transmitting impulse. In each instance the pressure fell rather than rose. The pulse-waves were extraordinarily large, and the heart evidently putting forth enormous effort. The pneumogastrics had not been severed, but the irritation of the nerve had no effect upon the pulse-rate, so that there was no reflex inhibition of the heart to interfere with rise of the arterial pressure. The failure of irritation of a nerve to cause rise of pressure shows that at this time the vaso-motor system was unable to respond to peripheral stimuli, and warrants the conclusion that the fall of arterial pressure which occurs in the advanced stage of nitrous oxide anæsthesia is due to vaso-motor paralysis.

The experiments which we have made with nitrous oxide gas prove that the characteristic effects of the inhalation upon the circulation are: slowing of the pulse, accompanied by a pronounced increase of energy in the single heart movement, and extraordinary increase of the size and force of the pulse-wave, and followed very late in the poisoning, after the failure of respiration, by excessive rapidity and feebleness of the pulse; primary rise of the arterial pressure of variable extent, followed after a time, and often after unexplained vicissitudes of pressure, by a progressive fall of pressure to zero. The chief cause of the rise and fall of pressure has been shown to be vaso-motor stimulation and vaso-motor paralysis, while the slowing of the pulse is due to stimulation of the inhibitory apparatus.

At this juncture the question naturally offers itself to us for solution, "Are these changes which we have seen due to an indirect or direct action of the nitrous oxide?"

In examining into this subject we first made experiments to determine whether the administration of a small amount of oxygen, along with the nitrous oxide, would prevent the development of anæsthesia. Atmospheric air contains twenty per cent. of oxygen, and we had prepared thirty gallons of a mixture containing one-half this proportion of oxygen,—*i.e.*, ninety per cent of nitrous oxide, ten per cent. of oxygen. This was administered by inhalation to a moderate-sized dog (Experiment 8). The whole of the gas was used up in eight minutes, and neither at the end of this period nor at any time during the inhalation was there the slightest anæsthesia.

Ten per cent. of oxygen is, therefore, capable of suspending the anæsthetic action of nitrous oxide.

The action of the nitrous oxide upon the pulse was, however, not suspended. Before the inhalation the pulse varied from 120 to 130; in twenty seconds after the inhalation it had fallen to 108; in twenty seconds later to 84; some seconds after, it was below 80, when for some reason it rose nearly to the norm, and remained at this position nearly half a minute, when it fell very suddenly to about 50, and remained about this rate until the end of the inhalation.

The arterial pressure before the inhalation varied in its average from 148 to 155; thirty seconds later it was 150; forty seconds later it was 145; thirty seconds later it was 149; thirty seconds later, 140; thirty seconds later, 157; thirty seconds later, 158; thirty seconds after this, 150; and about at this figure it continued until the end of the experiment.

This experiment appears to show that the addition of ten per cent. of oxygen suspe ds the anæsthetic effect of nitrous oxide, as well as its influence in raising the blood-pressure, but not its power of reducing the pulse-rate by inhibiting the heart.

The conclusion that the anæsthetic and vaso-motor influence of nitrous oxide are in some way apart and separate from its action upon the pulse would appear to receive confirmation from the experiments made upon nitrous oxide by itself. The influence of nitrous oxide upon the pulse was very uniform in the different experiments, and consistent

throughout the single experiment, while its influence upon blood-pressure was not only very different in the different experiments, but also varied very curiously and unaccountably in the one experiment, the blood-pressure rising and falling without any obvious rhyme or reason. It would look as though nitrous oxide acts upon the heart and nervous system directly, but has little or no direct inherent influence upon the vaso-motor centres or the brain cortex.

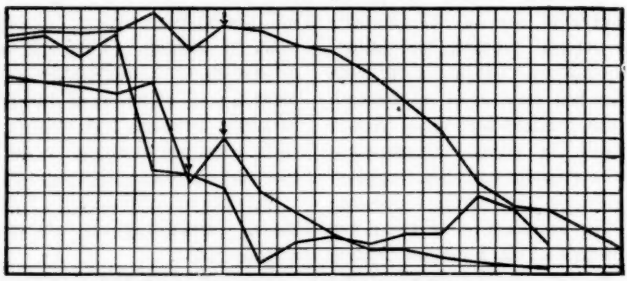
The experiments with nitrogen are three in number. In the first experiment (Experiment 9) unconsciousness was complete one minute and ten seconds after the beginning of the inhalation, but it may have been present before this time. Death occurred three minutes after the beginning of the inhalation of the gas; the arterial pressure was raised in forty seconds twelve millimetres; during the next ten seconds it went up to ten millimetres more, and then fell abruptly eighty to ninety millimetres in the next ten seconds, and continued to fall until death.

In the second experiment (Experiment 10) consciousness was completely lost one minute after the beginning of the inhalation. The arterial pressure slowly rose, reaching its maximum forty seconds after the beginning of the inhalation, when it had gone up fifteen millimetres. After this it fell slowly for a time, and then rose again, one minute and a half after the beginning of the inhalation being a little above the point at which it had started; it then fell, at first slowly, and afterwards more rapidly, until death, which occurred three minutes and ten seconds after the beginning of the inhalation.

In the third experiment (Experiment 11) the pressure at first descended a little, and then rose again, so that forty seconds after the beginning of the inhalation it was three millimetres below its starting-point. After this it fell, at first slowly, and then rapidly, until death, which occurred two minutes and forty seconds after the beginning of the inhalation. In this experiment unconsciousness occurred exactly one minute after the beginning of the inhalation.

In each of the experiments with nitrogen the pulse was at first more or less increased in frequency, and afterwards became slower, usually continuing so until death. The pulse-waves were also markedly increased in size, being, even when the pressure had almost reached zero, much greater than in the normal animal.

FIG 4.



EXPERIMENTS 9, 10, 11.—Inhalation of Nitrogen.

These experiments show that during the inhalation of nitrogen there is usually a slight rise in the arterial pressure, followed by a fall, and accompanied by primary increase of the pulse-rate, which increase varies very much, and is followed by a secondary fall.

In contrasting the results which we have obtained with nitrogen and with nitrous oxide, our experiments would seem to show that anæsthesia is produced more rapidly when nitrogen is used than when nitrous oxide is inhaled; but, in reviewing the details of our work, we are led to suspect that in some of our experiments with nitrous oxide, owing to a leak in a valve, a little air got mixed with the gas, and thereby delayed the coming on of unconsciousness. Further, as has already been stated, in some of the experiments with nitrous oxide, anæsthesia may have been developed before it was noted. When to these facts are added the circumstance that our experiments with nitrous oxide were much more numerous than those with nitrogen, and that in several cases anæsthesia was produced by nitrous oxide more quickly than in any of our experiments with nitrogen, we do not think that nitrogen can be considered to be a more rapid anæsthetic than nitrous oxide.

The changes in the circulation produced by nitrogen and nitrous oxide differ in quality rather than in kind. In each agency there is

a tendency to a rise of pressure, followed by a fall, the rise of pressure being much less with nitrogen than with nitrous oxide. The pulse was, on the whole, similarly affected by the two gases, a strong indication that the action of nitrous oxide upon the pulse is, after all, rather indirect than direct.

Our experiments, therefore, indicate a parity of action between nitrogen and nitrous oxide, and make it very probable that the two agencies act in a similar manner,—that is, by shutting off oxygen.

The blood-changes which are produced by the inhalation of nitrous oxide or nitrogen resemble those caused by mechanical asphyxia, although they are not identical. The rise of pressure is usually much greater in mechanical asphyxia than during the inhalation of either of these gases, but by a number of experiments we have found that even when the trachea is hermetically sealed the amount and duration of the circulatory disturbance varies remarkably, being in some cases very much greater than in others.

It seems to be that *a priori* it might be expected that the changes of the circulation produced by the inhalation of the inert gas should resemble in kind those caused by mechanical arrest of respiration, but should not be identical with them. The mere stoppage of the passage of gas in and out of the lung, and the consequent violent efforts of breathing, must have some influence upon the peripheral nerve filaments in the lungs, which influence would, in turn, react upon the centres of respiration and circulation. Moreover, the gases in the blood differ when the respiration is mechanically arrested from those which follow the inhalation of an inert gas. Under the latter circumstance there is no check of the throwing off of carbonic acid from the blood, although the formation of carbonic acid gas is arrested; in mechanical asphyxia the throwing off of carbonic acid from the blood is put an end to; consequently, while in mechanical asphyxia there is accumulation of carbonic acid in the blood, in the asphyxia caused by an inert gas the carbonic acid in the blood becomes less than normal. Both mechanical and gaseous asphyxia result in the lessening of the oxygen of the blood. In this, and in this only, so far as the gaseous conditions of the blood are concerned, the two processes have a common effect.

The changes in the circulation produced by the inhalation of nitrous oxide or of nitrogen resemble somewhat those caused by mechanical asphyxia. Certainly any differences which may exist are not of sufficient foundation for any argument that nitrous oxide and nitrogen act as direct anæsthetics, or, in other words, as substances which deprive animals of consciousness by virtue of properties inherent in themselves. The similarity in the action of the two gases, both as to the general symptoms which they cause and as to the circulatory changes which they produce, is striking, and indicates distinctly that they have a common action. The action of nitrogen is certainly simply that of an inert substance which shuts out oxygen, and the whole mass of evidence is concordant in showing that the anæsthesia produced by the inhalation of nitrous oxide is due to the shutting off of the supply of oxygen from the nerve-centre.

Our research upon nitrous oxide might well have ended at this point, but the results reached have suggested the propriety of determining the effects of an excess of oxygen and carbonic acid upon the blood-pressure. (See Part II.)

(To be continued.)

THE VALUES, RELATIONS, AND DANGERS OF ANÆSTHETICS.

By G. Archie Stockwell, M.D., F.Z.S., Detroit, Michigan.*

THE question of a choice of anæsthetics for general purposes, or for the more common surgical operations, is still, in many quarters, a moot one. Chloroform, ether, methylene chloride, ethyl bromide, nitrous oxide, and the so-called "triple" or "A.-C.-E. mixture" (alcohol 1 part, chloroform 2 parts, ether 3 parts) have each their adherents among medical men of the highest professional standing.

In the medical press, also, periodically appear essays and discussions having for their aim the establishment of the superiority of one or another of these agents, but as these for the most part are partisan in character, they contribute little towards the sum total of knowledge.

The fact is, that too much care cannot be exercised in the selection of an anæsthetic, not alone in consideration of the relations of the agent, but also as regards its strength and purity. Much of the opprobrium that has in certain instances attached to ether, chloroform, ethyl, and methylene, it must be acknowledged, was primarily due to employment of weak, crude, and impure products.

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On the contrary, the uniform success attained, with freedom from accident, by the use of chloroform by the surgeons of the Scottish school, must be attributed not alone to the fact that fewer people submit to anæsthesia in Scotland, but also to the care in the selection of the drug, and the invariable rule of testing its quality before employing.*

It may further be said that neither clinical experience nor experimental research has yet been able to demonstrate positively the exact condition to which any one anæsthetic is applicable, or even under which it can be most advantageously employed. Each individual case requires special study, and the final selection must be based upon the physiological phenomena peculiar to the disease, the same as induced by the anæsthetic, and upon individual idiosyncrasies. Finally, when the selection is made, the agent should be employed with the utmost care and caution, for it should be remembered that the very physiological phenomena that permit anæsthesia, and that are thereby produced, must always be a source of danger,—a danger that may be greatly enhanced by obscure morbid conditions.

CHLOROFORM.

Of all the anæsthetics, chloroform or *terchloride of formyl* (CH,Cl_3) is one of the most rapid in the production of anæsthesia, and at the same time one of the least obnoxious as regards inhalation; the effect produced is most permanent, the drug itself most convenient as regards bulk and handling, and recovery from the influence, in general, is more speedy than from most anæsthetic agents. These are desirable and most important considerations, but, unfortunately, are in no small degree overbalanced by certain specific disadvantages.

Chloroform has, first, a stimulating, and second, a sedative, action upon the brain. It derives its anæsthetic properties from its paralyzing influence upon the ganglionic centres of the sensory nerves, while the reflex functions of the cord are also held in abeyance, facts which should constantly be borne in mind.

The denial, by those who uphold the superiority and efficiency of this anæsthetic (or who seek to restore it to its early status and popularity), that shock and cardiac arrest are results made possible by its administration, is, perhaps, but natural; and many efforts have been made to substantiate this, the most notable and recent being the Commission of the British Medical Association and the "Hyderabad Chloroform" Commissions, known respectively as the first and second.

The former, composed of such notables as Anstie, Richardson, Ringer, Gosselin, and Vulpian, in spite of an admitted bias, arrived at conclusions directly opposed to those formulated by the two Hyderabad Commissions. Of the latter, the first was composed of Dr. Helier, Messrs. Kelly and Chamarette, and Surgeon-Major Lawrie; the second, of Surgeon-Major Lawrie, Rustomje Hakim, Drs. C. Bomford and T. Lauder Brunton, who associated with themselves also the members of the former Commission.

The first Hyderabad Commission reached practically the same conclusions that are now formulated by its successor; but they received little attention, since (1) they controverted what were held to be established physiological facts, and (2) the individuals composing the Commission were practically unknown outside of their own immediate professional and social circles, and possessed no reputation as either original observers or as teachers. It was for these reasons that the second Commission was organized, Dr. T. Lauder Brunton being added as a representative of the *Lancet*, of London, and a "make-weight."

The history of these two Commissions is interesting also, and, aside from the distinctive "chloroform" title, evidence that they were assembled for *ex-parte* purposes, and also that the conclusions arrived at were foregone, even before work was begun. The *Lancet*† admits that both owed their origin to Surgeon-Major Lawrie, who was animated not with a thirst for precise knowledge, but with a desire to vindicate his late teacher,—Professor Syme,—

* Deaths do occur from chloroform in Scotland, notwithstanding a contrary belief has been assiduously promulgated. Such cases are not, however, often brought to light, since coroner's inquests are unknown, and there is not the opportunity for newspaper publicity that occurs in England and America. A casual search of medical journals reveals the following chloroform casualties: Edinburgh Royal Infirmary (1878 to 1880), 3 deaths; Western Infirmary, Glasgow (1883 to 1886), 3 deaths; Royal Infirmary, Glasgow (1883 to 1885), 2 deaths; other parts of Scotland (1881 to 1883), 6 deaths. England, 110 deaths to 14 in Scotland during the same period. Population of England in 1880, 28,247,151; Scotland, 3,991,490. Ratio of deaths in England, 1 to 256,792; in Scotland, 1 to approximately 285,107; *vide* Dr. Alex. Wilson.

† January 18, 1890.

who was wont to assert his belief that this agent might be "administered as an anæsthetic with perfect safety, provided the administrator watched the respiration with due care." To give still further *éclat*, the Nizam of Hyderabad was induced to associate his name and contribute liberally to its support, besides giving it the sanction of his government.

The report of this second "Chloroform" Commission, as given by the *Lancet*, conveys the intelligence that four hundred and thirty experiments were performed, three hundred and sixty of which were on the pariah dogs of India—creatures whose physiological relations are not at all well understood, and whose lives, far from approaching those of domestic canines, are more nearly allied to the feral *Canidæ*—and seventy on monkeys, the latter chosen under the mistaken supposition that like physical conformation begets like physiological characteristics. The experiments, as announced, were undertaken to demonstrate—

"The effect upon blood-pressure, heart, and respiration, of the inhalation of chloroform, ether, and the 'A.-C.-E. mixture' (alcohol, chloroform, and ether), administered in various ways and under varying conditions."

The fact, however, that one hundred and nine pints of the first-named fluid were expended against but eleven of ether, which last must also have furnished no inconsiderable portion of the triple compound named, is to most minds corroborative evidence that the experiments were undertaken, primarily and solely, for the purpose of vindicating the preceding Commission,—all of whom were associated with this Committee,—*et al.* Indeed, this is practically admitted in a second statement of the objects of the Commission, which are given,—

"1. To test the suitability and safety of chloroform as an anæsthetic.

"2. The effect of pushing the above-named anæsthetic (*a*) to a dangerous degree, and *more especially till respiration ceases;* * (*b*) until death results.

"3. The modifications in the effects of these anæsthetics which result from (*a*) asphyxia in varying degrees, and produced by various means; (*b*) from the use of drugs such as morphine, atropine, physostigmine, and others.

"4. The reality or otherwise of the alleged liability during ordinary chloroform administration to the occurrence of primary or secondary syncope or stoppage of the heart, brought about either by shock or through fatty or weak heart, or hemorrhage, or by change in the position of the body. . . .

"5. The effect of the anæsthetics above mentioned upon different animals, more especially monkeys, as the nearest approach to human beings." †

The conclusions deduced, briefly summarized, are as follows, the paragraph numbers referring to the report embodied in the *Lancet* (January 18):

"Chloroform, when given continuously by any means which insures its free dilution with air, causes a gradual fall of the mean blood-pressure, providing the animal's respiration is not impeded in any way. . . . If the chloroform is less diluted the fall is more rapid, but is always gradual, so long as the other conditions are maintained; and however concentrated the chloroform may be, it never causes sudden death from stoppage of the heart" (Paragraph No. 1). . . . "The theory which has hitherto been accepted is that danger in chloroform administration consists in the stoppage or slowing of the heart by vagus inhibition. This is now shown to be absolutely incorrect" (Paragraph No. 18). . . . "Granting, then, the truth of Ringer's conclusions from the experiments upon the frog's heart (*which have not been repeated and confirmed by the Commission*),‡ that chloroform has a gradual paralyzing effect upon the heart-tissue, we must conclude that such an effect, in the degree in which alone it could occur in the practical inhalation of chloroform, would rather be a source of safety than of danger" (Paragraph No. 19). . . . "In . . . the case of a dog that had had morphine, remarkable slowing and even temporary cessation of the heart's action occurred again and again at the same moment respiration stopped, but the heart invariably recovered itself. . . . The failure of the heart, if such it can be called, instead of being a danger to the animal, proved to be a positive safeguard, by preventing the absorption of the residual chloroform and its distribution through the system" (Paragraph No. 22).

* The italics are mine.—AUTHOR.

† This premise, founded on the supposition that like physical conformation begets like physiological conditions and attributes, is possessed of neither reason nor fact. No comparative physiologist would have fallen into this error.

‡ Italics mine.—AUTHOR.

"Morphine appeared . . . to render the rise of blood-pressure that occurred when chloroform was discontinued slower and less complete, and to bring about a more or less permanent condition of anæsthesia" (Paragraph No. 31). . . . "The other drugs had no effect upon the action of chloroform, except when their own special action became the leading feature in the case" (Paragraph No. 32). "There is nothing to show that atropine does any good, . . . and it may do a great deal of harm" ("Practical Conclusions," No. XIII.).

"Chloroform has no power of increasing the tendency to either shock or syncope during operations. If shock or syncope from any cause does occur, it prevents, rather than aggravates, the dangers of chloroform inhalation" (Paragraph No. 37).

"The experiments on dogs that had been dosed with phosphorus for a few days previously, show that the fatty, and consequently feeble, condition of the heart and other organs so produced have no effect in modifying the action of chloroform. . . . Numerous attempts were made in these animals to produce shock by operations in recumbent and vertical positions, but without any more result than in those that were healthy" (Paragraph No. 38). "The truth about fatty heart appears to be that chloroform, *per se*, in no way endangers such a heart; but, on the contrary, by lowering blood-pressure, lessens the work the heart has to perform, which is a positive advantage. But the mere inhalation of chloroform is only a part of the process of administration in practice. A patient with an extremely fatty heart may die in mounting the steps in front of his own hall-door, or from fright at the mere idea of having chloroform or of undergoing an operation, or during his involuntary struggles. Such patients must inevitably die occasionally during chloroform administration, and would do so even were attar of roses, or any other harmless vapor, substituted for chloroform" (Paragraph No. 39).

"As regards the effect of chloroform upon different animals, it may be said to be the same as far as its anæsthetic action is concerned" (Paragraph No. 42). . . . "The cases . . . are quite sufficient to show that animals are just as liable to death from careless administration of chloroform as human beings; and the accidental deaths which occurred during the experiments of the Commission *afford the best possible proof that the effects of chloroform are identical in the lower animals and in the human subject.** The statement so frequently made that dogs are more resistant to chloroform than human beings is entirely incorrect" (third paragraph under caption of "Accidental Deaths").

"The experiments with ether show that it is impossible to produce anæsthesia with this agent unless some form of inhaler is used which thoroughly excludes the air" (Paragraph No. 45). "If surgeons choose to be content with a condition of semi-anæsthesia, it can, no doubt, be produced with perfect safety, though with discomfort to the patient, by ether held rather closely to the mouth. Such a condition of anæsthesia would never be accepted by any surgeon accustomed to operate under chloroform. If more perfect anæsthesia is required, it can be procured by excluding the air more rigidly, but then *there is exactly the same danger as in giving chloroform*" (Paragraph No. 46).

Careful perusal of the foregoing, which embody the most salient points, will, with impartial critics, be sufficient to impugn their value; they are, in fact, self-condemnatory. Further, the evidence presented, in spite of the manifest bias in favor of chloroform and the eager desire to condemn ether, is very far from being to the effect that it is other than easy to induce a fatal result through the administration of the former anæsthetic, but that, with proper precautions, lethal accidents may in many cases be averted. This certainly is far from being new or startling information to anæsthetists.

The assertion, however, that is implied if not made (Paragraph No. 46), that chloroform is superior, or, at least, equally safe with ether, is erroneous, and founded upon ignorance—duly manifested on the part of the Commission—of the latter drug and of the mode of its administration; it will be news to most surgeons that they generally procure only a semi-anæsthesia. All in all, this is a most misleading and unfortunate paragraph, and has led certain friends of chloroform to boldly give utterance to pernicious and unwarranted statements, such as, "It has now been demonstrated that this anæsthetic may be given in any case requiring operation with perfect safety and ease." And even the *Lancet* commits itself editorially in the following:† "The prac-

* Italics mine.—AUTHOR.

† January 18, 1890.

tical outcome of the research would appear to be that deaths from chloroform are not inevitable; they are therefore preventible, and by due care in the administration they may be with certainty avoided."

Evidently the editor at the time failed to appreciate the full force of his utterance, since, taken as it reads, it is implied that a death under chloroform anæsthesia, under any and all circumstances, is avoidable, and hence would demand the criminal indictment of the surgeon and his anæsthetist. In a a later issue,* however, in reply to numerous criticisms, the *Lancet* modifies its position by stating it was intended to express "the conclusions of the Commission rather than our own."

According to Dr. Laurence Turnbull,† nearly four hundred deaths are definitely recorded as due to chloroform anæsthesia. If the unreported cases are likewise estimated, it may easily be surmised that the total amounts to at least five hundred, a figure more than treble that assigned to ether, many of the fatalities of which, moreover, are of doubtful character. These cases all, from the stand-point of the Hyderabad Commissions, also impugn the skill, competence, and care of some of the most distinguished authorities, including Sir James Y. Simpson, Erichsen, Professors Billroth and Volkmann, Sir Geo. B. B. McLeod, J. Farrant Fry, Francis W. Clark, Professor Syme, Hunter McGuire, W. A. Hammond, James Wood, Willard Parker, F. H. Hamilton, Alden March, Moses Gunn, W. W. Dawson, and other eminent surgeons, past and present, who are to be condemned as bunglers, incompetents, or—worse!

There may be several objections taken to the unreserved application of the experiments of the Commission, especially to man.

That chloroform as a general anæsthetic is not as safe as ether, we have the evidence, based upon clinical experience, of scores of competent witnesses, not alone in the United States, but in Great Britain, Ireland, and upon the continent of Europe. So recently as February 10, at the Medical Society of London, Mr. Bailey and Mr. Woodhouse Braine, two of the ablest and best known of British anæsthetists, gave unequivocal testimony in favor of ether, and claimed, most justly, that this anæsthetic "has obtained the preference by the great majority of surgeons." Mr. Teale, also, at the last session of the British Medical Association,‡ made practically the same remark, and added that, since substituting ether for chloroform, he had "no anxiety whatever; the patients get well; the operations are simplified; and there is in every instance perfect anæsthesia." Juillard, of the Geneva clinic, and Dumont, corroborate Mr. Teale.

It has been generally taught that the fatal results of chloroform were due to cardiac arrest. This the Commission denies, claiming instead paralysis of respiration, basing its conclusion on the experiments conducted on dogs. It must be remembered, however, in spite of the dictum pronounced that "results" are identical in man and lower animals, that such is without force, coming as it does from individuals possessed of but meagre knowledge of comparative physiology; moreover, the statement is untrue in more than one particular. Dogs are not human beings, and repeated research and experiment has proven that exact parallels are impossible. To morphine, the Commission says, pariah dogs are "very indifferent." Such is not true of domestic canines, which are peculiarly sensitive to opium and its derivatives, a very minute dose, comparatively, oftentimes proving lethal (Youatt, Mayhew, Blaine), as has been repeatedly proven to the writer through personal experience. Even domestic canines of the same precise breed vary materially, according to latitude, altitude, climate, and concomitant surroundings, much more so than human beings; and the dogs of Europe have the vascular system more fully developed than those of America, whereby operations upon the former are attended by much more profuse hemorrhage. Professors Wood and Hare justly remark: "We have given elaterium to dogs until it has caused death, but it has not purged. Suppose that every dog in India had had administered to it elaterium without the production of purgation, would that prove that elaterium does not purge man?"§

Regarding the absence of shock and inability to produce the phenomena thereof in the animals experimented upon, and upon which no inconsiderable stress is laid, it is well known to comparative physiologists that while shock may obtain in man and in some higher (especially *domestic*) animals, as the result of the administration of chloroform,

* March 29, 1890.

† "Artificial Anæsthesia," 1889.

‡ Leeds, August 13–16, 1889.

§ *Medical News*, February 22, 1890.

such is practically non-existent in the majority of feral creatures, notably the *Simiadæ* and *Canidæ*.

Again, for all three hundred and sixty pariah dogs* in India have died through respiratory failure, as the result of the administration of chloroform, it must be remembered that a far greater number of the domestic form, in England, France, Germany, and America, under precisely parallel lines of experiment, have succumbed to cardiac syncope. We may believe, however, that in many instances animals to whom lethal doses of chloroform vapor are administered do succumb to pulmonary paralysis, but it is denied by all clinical observers that such is an invariable, or even common, sequel, so far as the human family is concerned. The majority of deaths in the latter are inconsistent with such view; the fatal result is usually sudden. The patient, in the midst of violent struggles, after a deep inspiration becomes at once practically lifeless, the pulse ceasing, or sometimes becoming distinctly and gradually feebler, before cessation of respiration. Further, in chloroform accidents in man of the sudden variety, considered to be due to cardiac syncope, certain conditions are present which are extremely difficult to obtain in animals. It is, I believe, generally conceded that chloroform fatalities may be induced in the latter through either pulmonary or cardiac arrest, or both, according to the method in which the drug is administered.

Dr. Snow long since reconciled these differences between the results of experiment and of clinical practice by showing that fatalities might happen in one of two ways, according to the amount absorbed: "(1) Chloroform gradually inhaled until death resulted, killed by gradual paralysis of respiration, the heart continuing to beat after cessation of respiration; (2) but when a large dose of the drug was suddenly taken into the system, the heart ceased beating before the respiration stopped; (3) it was also thought that this sudden paralysis might set in before insensibility was produced. The cardiac paralysis was considered to be the chief factor in the fatal result, because efficient artificial respiration did not resuscitate these cases. There was an impression that the cessation of the respiration might be entirely remedied by artificial respiration, but that the affection of the heart was necessarily fatal."

These views of the action of chloroform were confirmed by the Commission of the Medico-Chirurgical Society, London, 1864; and also by a Committee of the British Medical Association in 1879, which, in its reports, states: "Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action. It may cause death in dogs by paralyzing either the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals. In most cases respiration stops before the heart's action, but there was one instance in which respiration continued when the heart had stopped, and only failed a considerable number of seconds after the heart had resumed." †

Surgeon-Major Lawrie displayed a decided animus against watching the pulse, in the report of the first Hyderabad Commission, that is also apparent in the report of the second. The statement is made by him also that "since the year 1856, in Great Britain, there is no death from chloroform recorded in which it was proved that the respiration, and the respiration alone, was attended to throughout the inhalation."

This is certainly untrue! Dr. Alexander Wilson, anæsthetist to the Royal Infirmary of Manchester, declares: ‡ "There are several fatal cases where the respiration only was attended to, and there are many more in which respiration was attended to as fully as possible." A notable case of this kind will be found in the *British Medical Journal* for 1884, vol. ii. p. 811.

Since the report of the Commission, a series of parallel experiments was undertaken by Professors H. C. Wood and Hobart A. Hare, of the University of Pennsylvania, that have an important bearing upon this subject, they say,—§

"As we use between us, in the laboratory of the University, many dogs yearly, a very large proportion of which are finally killed by chloroform, we may be excused for our positive assertion that chloroform *is* a cardiac paralyzant, and does oftentimes kill dogs by direct action upon the heart or its contained ganglia, especially since we have been strengthened in our opinion by the fact that Dr. Reichert, Professor of Physiology in the University, has reached results confirming our own, and has frequently demonstrated the same to the University classes. . . .

* The pariah dog is practically a *feral* creature.

† *British Medical Journal*, 1879, vol. i. pp. 1 and 921.

‡ *Medical Chronicle*, vol. xii. p. 9.

§ *Medical News*, February 22, 1890.

It has been the custom of one of the authors,* in his lectures before the University classes, to demonstrate, by means of the respiratory tambour, the mercurial manometer, and the kymographion, a cardiac arrest through chloroform. Further than this, we have at various times taken tracings proving the same facts.

"The statements that have been recently made in the Indian journals and in the *Lancet* (London) have led us to re-examine the subject, and to make a series of experiments upon it with great care. We have also varied and extended these experiments in order to determine whether chloroform paralyzes the heart by direct influence, or by an indirect action through the vagus. . . . In all cases accurate tracings have been made by means of the kymographion and the respiratory tambour.

"The experiments . . . show that chloroform acts as a powerful depressant poison upon both respiration and circulation; that sometimes the influence is most felt at the heart, and death results from cardiac arrest; that in other cases the drug paralyzes primarily the respiratory centres, while in other instances it seems to act with equal force upon both medulla and heart. So far as practical medicine is concerned, it makes little difference whether the heart stops just before or just after the respiration, so that those cases in which cardiac and respiratory arrest are almost simultaneous, are, for the purposes of the clinician, the same as those in which the heart-arrest precedes respiratory paralysis. Finally, the results of our new experiments also coincide with our previous experience in the laboratory, and with what we believe to be the general belief of physiologists, that cardiac arrest is specially prone to occur when chloroform is administered rapidly and in concentrated form."

There are also several reasons why objections must be taken to the unreserved application of the conclusions of the experiments of the Commission to man. Dr. Alexander Wilson points out that there are differences existing in the action of chloroform on the heart of man and animals. Among others are the relations of the vital capacity to size, and the interference with complete filling of its lungs, resulting from restraint and holding of the animal.

It has often been shown that suddenly fatal cases are rare in human subjects in which there is any impediment to the free expansion of the chest. Dr. Clover long ago pointed out that phthisical patients are less likely to take a fatal dose of chloroform than those with healthy lungs, because their chloroform-absorbing capacity is diminished. Again, it has been noted that but few die when chloroform is inhaled by patients lying on the side; also few, if any, sudden deaths attributable to the use of this anæsthetic are reported in cases of ovarian tumors. The explanation is, that the interference with full expansion of the lungs by the position or presence of the tumor prevents the lungs taking in the unnecessary fatal dose. On the other hand, the greater number of suddenly fatal cases occur in people with healthy chests and large vital capacity. The anæsthetic is administered to the patient in a natural position that affords the respiratory muscles full play, whereby the chest is completely filled.

It is, therefore, worth considering if the holding of a struggling animal, such as a dog, is not especially apt to so interfere with its breathing as to prevent a full dose being taken, particularly as the animal would not likely be held in its natural position. There is decided evidence afforded by the report of the Hyderabad Commission that in several instances the holding of the animal did actually interfere with respiration. If such was the case in one, it was probably the same in many, especially as the dog's thorax is so shaped that to hold the forelegs together in front would prevent complete expansion of its chest, and thus prevent suddenly taking a fair or even average dose of chloroform vapor. Again, in animals we have the absence of desire to inhale freely; and in at least one fatal case reported in man the desire to inhale chloroform freely contributed chiefly to the fatal result.

Among human beings the subject is usually young or middle-aged, with an expansile chest. Chloroform is willingly and quietly inspired until semi-unconsciousness supervenes, when the fauces and glottis are also insensitive; then, during a struggle, with or without holding the breath (the patient often in an upright position and with arms fixed by assistants, which gives the respiratory muscles good purchase), one or two deep inspirations are secured at the greatest advantage, thereby obtaining the maximum amount of chloroform, and the subject becomes instantly pulseless. Here is manifested the desire to speedily obtain the full influence of the drug, the voluntary inhalation followed by the still, steady, conscious anxiety to inhale more; and then the involuntary deep

* Dr. H. C. Wood.

inspiration, in the natural position in which such inspiration can best be taken.

But it will be observed these are all conditions extremely difficult and often impossible to secure in experiments on animals, and it is only under such precise conditions that cardiac paralysis has been induced in man. The interval between the cessation of the heart and of respiration is so short that these points, trivial though they seem, may easily be of importance in modifying the result.

Aside from the foregoing objections to the work of the Commission there are other apparently serious flaws:

First.—It has always been asserted by the advocates of the cardiac-syncope theory of chloroform fatalities that it is only under certain circumstances, and by a certain definite combination of factors, that the drug can be introduced into the circulation in quantities sufficient to paralyze the heart, and that this particular combination occurs very rarely,—only about once in two or three thousand administrations. Because the Commission did not obtain this combination in less than five hundred attempts (really in *only four* instances were the surroundings and attendance made favorable thereto), they conclude such cannot exist.

Second.—Under such circumstances it will require something more than mere assertion, backed by phosphorous experiments upon dogs (in whom danger from shock is practically non-existent), to convince the medical world that the inhalation of chloroform by a patient possessed of fatty heart is as innocuous as a whiff of "attar of roses."

Third.—In spite of the fact that so well-known a gentleman as Dr. Lauder Brunton has been enlisted in the affirmative, it must be remembered that the able editor of the *Practitioner* is a *physician* and not a surgeon, the distinction being very sharply drawn in practice as well as by title in Great Britain. The practical clinical experience of the physician with anæsthetics is as nothing when compared with that of the surgeon; and though Dr. Lawrie is of the latter class and rank, it must not be forgotten that he was, and is, the exact antithesis of an unbiased observer, having long asserted, in the most positive and aggressive manner, opinions in exact accordance with the findings of the Commission of which he was a member. Further, that the former is not infallible, may be quoted his assertion* that small doses of chloroform are more apt to produce death than large, because "the reflex contraction of the vessels is destroyed, while the heart is stopped or slowed, so that the irritation of a sensory nerve may produce syncope by stopping the supply of the blood from the heart, while the blood still flows rapidly from the arterial system through the capillaries into the veins." If this were true, it would inculcate more cases of heart-failure under ether than chloroform, since the former is more irritating to the upper air-passages than the latter.

Fourth.—The climate of India is such that it is impossible to obtain or preserve pure ether, so that an impure product was obtained for the experiments carried out by means of this anæsthetic.

Fifth.—The investigations consisted solely of laboratory work, as to the value of which a large number of medical men, surgeons, and practical physiologists especially must entertain serious doubts.

Sixth.—It must be admitted, also, that when laboratory experiments clash with clinical observations, the latter must have precedence; the former only lead the way to clinical studies, whereby the final verdict must be determined.

Finally.—The truth regarding chloroform appears to be that, while its administration in dilute doses tends to heart paralysis in man, in more concentrated form it may induce both cardiac and pulmonary arrest.† These facts alone evidence the superiority of ether as an anæsthetic, in which the sole danger, so far as lethal exit is concerned, is from paralysis of respiration. Most of us have seen, or are familiar with, unavoidable, serious, and even fatal accidents from chloroform, yet very few have ever witnessed any untoward results from ether, if carefully and understandingly administered. Again, it must be remembered that chloroform requires a carefully graduated admixture of atmospheric air,—not to exceed three per cent., since five per cent. is admitted to be invariably attended by fatal consequences. This is a very serious drawback oftentimes, since it is almost impossible to secure exact or even approximate proportions.

(To be continued.)

* "Materia Medica and Therapeutics."

† "Aside from fatty and brown atrophy, particular attention must be directed to degeneration of the heart-muscle occurring in consequence of long-continued chloroform anæsthesia. Death occurs after prolonged anæsthesia, increasing collapse, especially when the body is weakened in other ways, as by hemorrhages during operation. This degeneration does not occur after ether.—Von Herff.

STUDIES IN THERAPEUTICS.—CANNABIS INDICA.

By John Aulde, M.D., Philadelphia, Pa.,

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Pharmacology.—The fact that no cases of acute poisoning have been reported from the use of this drug may be accounted for by reason of the limited amount which is required to produce an effect upon the economy, together with the knowledge that for generations it has been used with a view to produce a peculiar form of intoxication. Medical literature furnishes quite an array of interesting cases in which it has been used experimentally for the purpose of determining if the reports handed down from Oriental writers regarding its merits in the production of euthanasia are warranted, and the general conclusion is that these narratives are highly colored, and scarcely to be accepted as representing the true position of the drug.

The antagonists are about the same as those in use for morphine-poisoning; the stomach should first be emptied by an emetic, when it will be in order to administer hot coffee, strychnine, and ammonia for its stimulating effect, along with other alkalies or acids. Electricity may be used, and atropine hypodermically will be found valuable, and, in case of great prostration, artificial respiration should be adopted, the patient in the mean time being kept awake and in motion until the effect of the drug begins to disappear. The dangers from poisoning are more likely to occur with preparations of cannabis on account of the inferiority, and it is, therefore, of paramount importance that only *assayed products* should be employed. The synergists which may be used will include all those remedies which depress the nervous system, such as anodynes like opium, belladonna, hyoscyamus, and the use of alcohol, with inhalations of ether and nitrous oxide. The bromides, with chloral, gelsemium, and ergot, all increase the sedative effects of cannabis. Absorption is sometimes quite rapid, although many preparations are inert, and a reasonable degree of caution must be exercised when any new preparation is ordered, and it should also be stated that when used hypodermically the power of this drug is greatly lessened, and, besides, allowance must be made for idiosyncrasy on the part of the patient. The mode of elimination is unknown.

A study of the general action of this drug is extremely interesting. Cannabis has long been known as one of the active ingredients of chlorodyne, a proprietary preparation, which is known to produce anodyne and hypnotic effects, and it has been variously classed as an exhilarant, a soporific and anodyne, a spinal stimulant as well as an indirect antispasmodic, and, what is even more strange, it seems to possess in a degree all of these different properties. The anæsthetic properties were known to the Chinese as early as the third century, and it is said the Scythians were accustomed to expose themselves, as in a bath, to the vapor of the seeds thrown upon hot coals. As a neurotic, it is similar to opium and alcohol, the stage of excitement being peculiarly well marked, and longer than that of opium. *Small doses*, as a rule, give rise to mental and motor activity, which is none the less delirium, although the effect varies with the individual; muscular activity is always a marked feature. The effect upon the brain is generally prompt, and is characterized by more or less delirium and hallucinations, which is followed by deep sleep. The impression obtains that these hallucinations are always agreeable, but, indeed, the fact is they are often more painful than otherwise the patient frequently being oppressed with a dread of some impending calamity. As a pain-relieving agent, cannabis is more especially indicated in functional derangements with local manifestations, as in *tic douloureux*, dysmenorrhœa with anæmia, due to obstruction, such as is not uncommonly met with in young girls, whose mothers call on the physician because they act so "silly." Its great value is shown in the power it possesses to overcome irritable conditions like delirium tremens, the cough of phthisis, as well as the flatulency of the climacteric.

The use of bhang (hashish) by the Orientals has evidently caused a mysterious halo to be associated with this drug in the minds of the ignorant and superstitious, but, knowing the effects of the remedy upon the nervous system, we are in a measure prepared to hear the most fabulous reports concerning its influence. A remarkable feature is that it affects the system differently according to the method by which absorption takes place, whether by inhalation, by the stomach, or when administered hypodermically. At times wonderful feats are accomplished in imagination, such as sailing through the air, walking on the ceiling, and apparently there is

an absolute loss of the sense of space and time. It is said that hashish was used by the Oriental chieftain to incite his followers to warlike deeds, and under the influence thus produced they became desperate when encountering an enemy, hence arises the name assassins (*haschaschins*). The disorders of vision and dilatation of the pupil may have something to do with the weird imagery that takes possession of the subject. Cannabis produces visions in some persons which may be pleasant or laughable, while they may be exceedingly disagreeable to others, and we cannot wholly credit the drug with its reputed fabulous properties, although in warm climates the effects are said to be most astonishing and seldom witnessed in temperate latitudes. If not accepted too literally, the following panegyric by Glendenning will serve to arouse the student's attention: "It acts as a soporific or hypnotic in causing sleep; as an anodyne in lulling irritation; as an antispasmodic in checking cough and cramp; as a nervine stimulant in removing languor and anxiety; also in raising the pulse and enlivening the spirits, without any drawback or deduction of indirect or incidental inconvenience; conciliating tranquil repose without causing nausea, constipation, or other signs of effect or indigestion, without headache and stupor."

Chronic poisoning is attended with œdema of the face, weakness and tremor, mental feebleness, and, finally, marasmus. Clouston, Phillips, Wood, and others have experimented with hemp by taking it personally, and their testimony corroborates substantially what has been said of its effects upon the system.

The special action of hemp upon the nervous system is worthy of mention. Both it and gelsemium are supposed to act upon the cerebral centres, and thus the sensation of pain is not perceived; but of course this action is in a more limited degree than that of opium, but both appear to have a decided sedative action upon the fifth nerve. Brunton suggests that the effect of hemp is due to the combined stimulant action on the nerve-centres of the brain and spinal cord, thus producing a paralyzing effect upon the peripheral ends of the motor nerves, like belladonna, hyoscyamus, etc., by which the sensibility is obtunded. Its influence upon the brain is shown by sleeplessness, its power to induce quiet in the attacks of delirium tremens, and more especially in mania, and, further, by the fact that for a considerable period —twenty-four hours — the effects of the drug do not disappear, as manifested by vertigo and headache. The tactile sense is greatly lessened, and thus it became at one time a remedy for the production of anæsthesia.

By some observers hemp is credited with the power to produce by its intoxicating influence a condition of affairs that exhibits the true character of the patient, but probably it would be more nearly correct to assume that the drug has temporarily suspended control over hereditary tendencies, and upon this basis we are able to account for the furious attacks of rage as well as the spontaneous outbursts of joy. These manifestations simply show that the subject has been curbed by his environment. The same mental and moral traits are supposed by many to follow the use of alcoholic preparations, but in all instances due allowance must be made for the impressions which are most distinct and dear to the mind previous to the ingestion of the drug, as undoubtedly they will be the most likely to come to the surface, just as dreams attend upon mental activity or a disordered stomach. The antispasmodic properties of hemp are well illustrated in its power to overcome spasm and pain, as seen in asthma, in hepatic, renal, and uterine colic.

The circulation is not materially excited; it is modified differently, depending on the time that has elapsed from taking the drug, but even this is somewhat irregular; a general sensation of warmth is experienced, except in the feet.

The respiration is variously affected, and may be increased or diminished. The temperature rises when the action of the drug manifests itself by way of muscular movements, but is lowered when sleep supervenes.

There is a marked improvement in the appetite of those who are under the influence of hemp for the first time, although the secretions of the alimentary tract are not materially affected; dryness of the tongue and constipation do not ordinarily follow its use, a fact which points to its exhibition in the treatment of those who have been addicted to the opium habit. Large doses cause derangements of the digestion, whether it be taken for the first time or after continuous administration, but not to the extent of opium, and the absence of after-effects seem to confirm what has just been stated. When a considerable dose has been taken for the

first time, vomiting may be expected to occur before the approach of the hypnotic period unless the dose has been unduly large.

The influence of cannabis upon the genito-urinary system has long been recognized, and it is said that impotence is not uncommon among hashish-eaters, which may be accounted for on the basis of repeated and too frequent overstimulation of the sexual organs. The aphrodisiac properties, however, are disputed, and doubts are entertained as to its value in augmenting the sexual function, except through suggestion in connection with the effect produced upon the nervous system. Hemp has the power to increase the energy of uterine contractions, though no claim is put forward that such contractions are initiated *de novo*, and it is here probably that we find an explanation of its value in the treatment of certain cases of dysmenorrhœa, by recalling the fact that rhythmical contractions of the organ are constant after the age of puberty, with or without pregnancy.

The urinary flow is somewhat increased, but this may have no more significance than a similar result which follows the use of quinine, which is generally noticeable when the person taking it lies down an hour or two afterwards.

Therapy.—From the preceding remarks upon the pharmacology of cannabis indica the reader will be able to formulate some general ideas for its employment in the treatment of disease, but, as intimated, no definite conclusions can be reached unless the pharmaceutical product has been demonstrated to possess therapeutic activity. Fortunately, at the present time, reliable preparations are to be found in the market, and with proper care in beginning with any new and untried preparation, no difficulty need be experienced from the inertness of the substance. Within the past few years numerous reports have been published in which cannabis has been given the credit for results obtained in the treatment of a number of affections where it was combined with other remedies, and where it was evident that the other ingredients were quite as much entitled to the credit as was cannabis. This is especially noticeable regarding the reports concerning its value in the treatment of *diarrhœa*, *dysentery*, and other bowel troubles. When this or any other drug is given singly in any particular disease, followed by favorable results, and this method of treatment is repeated again and again, we have at least an empirical basis for regarding with favor the particular drug that has been used; but when a drug like cannabis indica is combined with such preparations as chloroform, bismuth salts, or mercurial preparations, the conclusion that cannabis is the active drug must be set aside, because in many instances these remedies mentioned are sufficient in themselves to effect a cure. That cannabis has considerable power through its influence upon the nervous system in checking ordinary cases of diarrhœa and dysentery will not be disputed, but when given alone in these cases it has but little value.

The good effects of cannabis are more pronounced in the treatment of *abdominal affections* in which pain enters into the make-up of the morbid complexus, and where there is an absence of increased activity of the circulation. In other words, it appears to be more especially applicable in those disorders which might be regarded as functional in character, and which often present the well-known features of *neuralgia*. *Dysmenorrhœa* is one of these affections, and while this trouble may be, and frequently is, due to various causes, a considerable number of these cases are dependent to a great extent upon the condition of the blood, the habits of the patient, or some occult nervous derangement, which is temporarily subdued by the narcotic influences characteristic of the drug. It has been extensively employed for the relief of this disorder in combination with chloroform, one of our most efficient stimulants when taken internally, but not infrequently a few drops of chloroform alone are sufficient to overcome this malady. When there is undue activity of the circulation, upon which the pain almost wholly depends, gelsemium alone will be sufficient; but in the cases marked by grave nervous disturbances, the combination of *gelsemium with cannabis indica* is strongly recommended.

℞ Ext. cannabis indicæ, gtt. v;
Ext. gelsemii, gtt. x;
Pulv. acaciæ,
Aquæ, āā q.s. ad f℥iv. M.

Sig.—Take one teaspoonful every ten minutes for an hour, then hourly thereafter, until relieved.

The majority of these cases uncomplicated by displacements, such as seen in young girls and married women, will be promptly benefited, and the menstrual flow appears, when there is no further trouble until the next period. Occasionally we meet with cases in which it appears that the dysmenorrhœa is

dependent upon a debilitated condition of the system, in which chloroform is especially indicated owing to its stimulating action; but, in the absence of this preparation, the cannabis indica may be combined with small doses of nux vomica, as in the following prescription:

℞ Ext. cannabis indicæ,
Ext. nucis vomicæ, āā gtt. v;
Pulv. acaciæ,
Aquæ, āā q.s. ad f℥iv. M.

Sig.—Take one teaspoonful every ten minutes for an hour, then at intervals of one hour until the pain is relieved.

The foregoing prescription will be found efficient in the treatment of the incipient period of *delirium tremens*, which is often accompanied by an extremely irritable condition of the stomach and furious delirium, but the initial dose should be at least a tablespoonful. In all probability the first dose will be sufficient to arrest the vomiting, and, if the drug is pushed, the patient will gradually fall into a natural-like sleep, and awake several hours after greatly refreshed and entirely free from the threatening symptoms presented a few hours previously. The same method of treatment is particularly applicable to that form of *nausea and vomiting*, with excruciating pain, which now and then attacks persons previously in tolerable good health, but who are suddenly seized with colic, paroxysmal in character, and only partly relieved by the eructation of gas. A few doses are all that are required, and the patients wonder if it is possible that so great a pain could be so suddenly vanquished. Cannabis has been highly recommended for the relief of *menorrhagia*, but it is not curative in the true sense of the term.

As a remedy for the relief of *supraorbital neuralgia* no article perhaps affords better prospects than cannabis, but it must be given in small doses at short intervals in order to bring the patient as quickly as possible under its influence. Given in the manner indicated above, but a short time—one, or, at most, two hours—will be sufficient to bring the patient under its influence, provided the preparation is reliable, and if such results do not follow, the dose should not be increased, but instead a new preparation should be secured. For the *cough of phthisis*, and for the *chest-pains* which accompany that disease, cannabis is of great practical service, and as these patients are often unwilling to take medicine, or the stomach is in such a condition that the sight of any medicine is offensive, it may be used in these cases in the form of tablet triturates, each containing $\frac{1}{10}$ of a grain without compression. These tablets may be taken at intervals of ten minutes for an hour, then at less frequent intervals; but, instead of swallowing them, they should be allowed to dissolve in the mouth, by which the effect is produced much more quickly than when taken into the stomach.

The action of cannabis upon the genito-urinary functions commends it for the relief of *impotence*, more especially when due to functional derangements, with a depressed condition of the vital powers, but in these cases care should be exercised that the drug is not given in too large doses. As synergists, it will be found advisable to combine with it small quantities of both nux vomica and damiana, as indicated in the following formula:

℞ Ext. cannabis indicæ,
Ext. nucis vomicæ, āā gr. v;
Ext. damianæ, gr. xx.
M. et fit. pil. no. xx.

Sig.—Take one pill after meals and at bed-hour.

It is also a useful remedy in the treatment of *gonorrhœa* as a pain-relieving agent, or for counteracting the tendency to the development of chordee, but its value in this direction must be comparatively slight unless given in large doses, and for that reason its use is not recommended.

Cannabin tannate and cannabinon have been put forward to take the place of this drug, but, unfortunately, only in exceptional instances have they been found efficient, probably owing to the changes effected by the chemical processes necessary in the course of their preparation. Clinical tests in several instances have shown that the tannate is a most *useful hypnotic* in the treatment of hysteria, being superior to either chloral or morphine, while *cannabine*, the pure alkaloid, is said to be a substance entirely different from the previously known resinoid called cannabin, and has been recommended as an innocuous and approved hypnotic medicament. Several cases of Basedow's disease (exophthalmic goitre) are said to have been favorably influenced by 5-grain doses of this preparation, given in the form of pill or with syrup and water, but its expense (one dollar and fifty cents per grain) precludes its use at the present time.

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The Therapeutic Gazette

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Leading Articles.

CARDIAC DYSPNŒA: ITS PATHOLOGY AND TREATMENT.

THE dyspnœa of cardiac affections is either mechanical or toxic, or both. In the toxic forms it may exist independently of any appreciable affection of the respiratory passages by the simple fact of spasm of the arterioles; in the mechanical forms its essential condition is blood-stasis in the lungs; in all cases it may coexist with bronchitis and emphysema.

In stenosis or insufficiency of the mitral the dyspnœa is largely, if not altogether, mechanical, being due to pulmonary engorgement. In the earlier stages the dyspnœa may be but slight, and only felt on active exercise (the dyspnœa of exertion); the heart may be quite competent to clear its cavities, except when an extra task is put upon it; in the later stages the engorgement is constant and the dyspnœa permanent.

In the incipiency of aortic regurgitant disease, dyspnœa of a mechanical character is a frequent symptom; any sudden violent exertion may put the patient in agony for breath; the left ventricle is only able to clear itself during rest or moderate exercise. When the disease is advanced and compensation is broken, the dyspnœa may be constant, as in mitral disease; in fact, the cardiopathy is likely to be complicated with mitral lesion; it more often happens, however, that the dyspnœa is paroxysmal, coming on at night, thus resembling true asthma. The dyspnœa of fatty degeneration, of chronic myocarditis (fibroid heart), of dilatation from whatever cause, ordinarily assumes this paroxysmal character, though always produced or aggravated by exertion. The same remark is applicable to the dyspnœa of aortitis and arteriosclerosis, pathological states to which attention has been much called of late, since the publication of Huchard's able work. Various factors concur in the production of this paroxysmal dyspnœa. The dyspnœa may be purely mechanical, being provoked by any exertion that fatigues the heart, any condition or position of the patient that embarrasses the heart's action. The paroxysmal dyspnœa of aortic disease, of myocardial degenerations, etc., which is so prone to come on in the night-time, waking the patient out of his first sleep, and compelling him to sit up and tug for breath, has been attributed to the recumbent posture, the stomach and viscera, especially after a full meal, being forced upward with the diaphragm and encumbering the heart's area. Moreover, any concomitant bronchitis and emphysema is likely to be aggravated in the night-time and when the heart is fatigued.

The above explanation of the pathogeny of the paroxysmal dyspnœa does not quite satisfy Huchard, who sees in this dyspnœa a phenomenon of arterial hypertension: "*Selon moi le pseudo-asthme aortique est dû à la hypertension arterielle; or, celle-ci est augmentée par la station horizontale et sous l'influence du sommeil, comme elle s'élève aussi par l'effort de la marche et du mouvement.*" *

This hypertension greatly augments the peripheral resistances against which the heart has to contend, producing a spasmodic condition of the arterioles, which is more or less constant. Now, aortic disease, according to Huchard, is very generally associated with a

* "In my opinion this aortic pseudo-asthma is due to arterial hypertension; now, this is augmented by the horizontal position and under the influence of sleep, as it is also increased by the effort of walking and of movement" (Huchard, "Maladies du Cœur et des Vaisseaux," 1889, p. 132).

peculiar diathesis called *arterio-sclerosis*, which manifests itself by a more or less general atheroma or sclerosis of the blood-vessels. The kidneys, sooner or later, participate, undergoing slow degeneration, and becoming incompetent for their function; the blood, poisoned by retained waste products, irritates the lining membrane of the arterioles, still further augmenting the hypertension. Hence, the dyspnœa of aortic degenerative disease is not only mechanical, it is also toxic, owing to the impermeability of the renal emunctory.

The same explanation is applicable to degenerative diseases of the myocardium dependent on arterio-sclerosis.

In the treatment of cardiac dyspnœa the leading indications are, 1, to make the heart competent for its work; 2, to calm nervous perturbation; 3, to eliminate toxic elements which may be the cause of the dyspnœa.

The first indication is likely to be very difficult of fulfilment. The dyspnœa is generally a symptom of failing compensation, and digitalis, strophanthus, and other heart tonics confer only temporary, and more or less uncertain, benefit. The heart cannot by any medication be made sufficient for great tasks, and the best that can be done is to adapt the work to the capacity of the heart. In the early stages of mitral disease the dyspnœa is only felt on exertion; the patient should be enjoined to work moderately and tax the heart as little as possible. Persistence in labor of an arduous kind is sure to overcome the heart and precipitate all the evils of uncompensated dilatation; while it is possible that rest and a judicious antirheumatic medication (iodide of potassium and the alkalies) may stay any further progress of the endocarditis which spoils the valves, and favor the supervention of a compensatory hypertrophy. The same may be said of the endocardial lesions, and consequent dilatation and dyspnœa, attending aortic regurgitant disease, which is often a rheumatic affection, though it may accompany or follow any of the infectious fevers.

The diet should be of a nutritious and digestible character, consisting of nitrogenous aliments rather than of carbohydrates. A diet largely of meat or fish is more easily digested than a strictly vegetable diet; moreover, with the latter diet, one is more likely to overload the stomach, and this distention cannot fail to embarrass the heart.

Regular daily action of the bowels is desirable, and to procure this result gentle laxatives (hunyadi, rubinat, cascara, etc.) may be demanded.

When the dyspnœa attends asystolism and broken compensation, the flagging heart may be for a time sustained by the so-called cardiac tonics,—digitalis, caffeine, strophanthus, etc.

To calm nervous perturbation, a judicious selection may be made from the various analgesics, antispasmodics, and narcotics of the materia medica. Hayden combines the calmative with the tonic treatment; his favorite prescription is ten minims of the spirits of chloroform with fifteen minims each of the tincture of digitalis and the tincture of perchloride of iron in an ounce of water every three hours.

Among the "respiratory medicaments," Professor Germain Sée speaks highly of "erythrophleum, in 20-drop doses of the alcoholic tincture; in simple or cardiac asthma the respiratory movements become slower and more ample under the influence of this remedy."* The same writer recommends iodide of ethyl and iodide of potassium as medicaments which directly favor the respiratory movements by a specific effect on the medulla oblongata. The iodide of ethyl is given in the dose of 6 to 8 drops five or six times a day; the iodide of potassium in 10- to 15-grain doses three times a day. But, after all, in grave cases, and sooner or later in all, resort must be had to hypodermic morphine, in doses sufficient to quiet disturbed nervous action, allay spasm, and facilitate respiration.

Since the attention of the profession has been particularly called to arterial hypertension as a principal factor in the dyspnœa of aortic disease and of arterio-sclerosis, it has been maintained that this dyspnœa is of toxic origin, and weighty considerations have been advanced by Huchard and others to establish this view of the case. Huchard points to the beneficial results attending the use of remedies that lower arterial tension,—bleeding, purgatives, nitrite of amyl, and nitroglycerin,—and especially to the utility of an exclusive milk diet in combating these paroxysms of aortic dyspnœa, causing them often to disappear in the space of a few days. Now, this medication, he says, acts in two ways and fulfils two indications,—first, by the abundant diuresis which it provokes, the milk diminishes the arterial tension, and promptly eliminates the toxic principles contained in

* "Maladies du Cœur," 1883, p. 511.

blood; secondly, it acts because it is bland and harmless, and does not launch into the current of the circulation, as do other aliments, and meat in particular, materials which, being incompletely eliminated, become rapidly toxic to the economy.

THE ANALGESIC ACTION OF METHYLENE BLUE.

THE histological researches of the last decades in overthrowing the old dogma that living matter was incapable of being subjected to artificial coloration, while of the greatest value from a histological point of view, are especially important as pointing out that certain coloring-matters possess special affinities for definite organic tissues; and the suggestion at once occurs that in this biological fact an indication for local therapeutics is to be found. If it is determined that certain substances become deposited in certain restricted tissues, as the list of these materials increases we may hope to find substances which may be capable of modifying disturbed action in the tissues for which they have especial affinity. Cellular therapeutics is based upon these data, and although yet in its infancy the fact remains that we have definite proof that certain substances are absorbed only by certain cells, and, as a consequence of their absorption, modify the vital processes occurring within them. As yet we have only been able to determine the occurrence of such absorption by the modification in color produced; in other words, the artificial colors, especially the aniline colors, are known to distribute themselves in certain definite directions. Among these methylene blue possesses a special interest, since it has been found that this coloring-matter has a special affinity for the nervous system, and especially for the axis-cylinders of the nerve-fibres, whether sensory or motor. The discovery of this fact by Professor P. Ehrlich and Dr. Leppmann (*Deutsche Medicinische Wochenschrift*, June 5, 1890) suggested the employment of methylene blue in affections of the nerve-trunks, especially in painful affections; and they have accordingly subjected their hypothesis to experimental study in administering it to twenty-five different cases of painful nervous affections, such as rheumatism of the muscles, tendons, and joints, and in every case it proved more or less efficacious in relieving pain. Their studies were made on the insane criminals in the Moabit prison in Berlin, and were, therefore, made on subjects subjected to the same conditions of hygiene, of alimentation, and to rigorous isolation, which facilitated absolute control of the patients, and reduced to a minimum any effects which might possibly be attributed to suggestion.

Their experiments were made with perfectly pure methylene blue, the experimenters laying great stress on the entire absence of even a trace of the chloride of zinc, a fact which they maintain to be of the greatest importance; for they claim that the purity of the coloring-matter is indispensable; that the coloration produced by the methylene blue be rigorously limited to the nervous element, while, further, the dangers of any poisoning are greatly reduced by the employment of a perfectly pure product.

The remedy was given in doses as large as 15 grains in a day in gelatin capsules without producing any toxic symptoms, although the usual doses were from 1½ to 4 grains internally and 1 grain hypodermically. Subcutaneous injections in two per cent. solution occasioned no pain and no local reaction other than a soft tumefaction, which disappeared in the course of a few days, while its administration, whether subcutaneously or by the mouth, produced no disagreeable results, no disturbance of the appetite, digestive functions, the bowels, or, in fact, any disagreeable after-effect.

With the exception of two cases out of forty who were the subjects of experiment, there was no vomiting; one of these was very anæmic and suffering from some cardiac affection, while the other had symptoms of an acute catarrh of the stomach. The rapid passage of the coloring-matter into the blood was demonstrated by the greenish tint of the urine, which occurred within fifteen minutes to an hour after the administration of the remedy. Within about two hours this tint became bluish green, and after four hours dark blue. To recognize these changes in the color of the urine, they found it, however, sometimes necessary first to warm it, when the change of tint was always detected. In addition, the saliva and the fæcal matter likewise assumed a bluish tint. Neither the skin nor the cornea ever acquired any blue discoloration.

The therapeutic results attained by these authors may be summed up in a few words.

In certain forms of localized painful affections methylene blue possesses marked analgesic action. This action was usually at-

tended with certain peculiar characters; thus, it usually manifested itself about two hours after the administration of the remedy, and continued to increase in intensity until analgesia was absolute, when the remedy had been given in sufficient dose,—1 grain when injected hypodermically, 2 to 4 grains when given by the mouth.

This course of the anæsthetic process is explained by Ehrlich on the grounds of the modifications which occur in the nerves of a living animal after methylene blue has been injected under the skin. In the first few hours in these cases the nerves acquire a diffused blue coloration, which finally gives place to bluish irregular granules in the axis-cylinder, and finally these granules disappear. It thus would seem that an insoluble combination is formed between the coloring-matter and certain constituent parts of the nerve-tissues, and, as a consequence, the chemical composition of the nerve is so modified that the analgesic action results from a loss of function of the nerve-trunk.

No direct influence was detectable on inflammatory swellings, and in various general disturbances, such as in the osteocopic pains of syphilis, round ulcer of the stomach, and neurasthenia, its effects were less evident. Favorable effect was, however, produced in two cases of migraine. No antipyretic action was discoverable. In many ways, however, this substance appears to act similarly to antipyrin, over which, however, it has the advantage of smallness of dose, cheapness, and the fact that hypodermic injections are absolutely painless.

THE THERAPEUTIC VALUE OF ELECTRICITY.

THE school of electro-therapeutists, which may be said to have been founded by Duchenne, has not made satisfactory progress during the last quarter of a century. The studies of this observer upon electricity in the clinic, founded upon some accurate anatomical and physiological knowledge of the muscular system, gave the subject an impetus which still survives to keep this agent before the profession, and to insure its recognition in spite of the abuses to which charlatanry or ignorant credulity have too often subjected it. Duchenne's work was chiefly upon an anatomical basis; his great aim was clinical results. The legacy which he left was a great mass of empirical observations on the action of electric currents upon the muscles and nerve-tissues in health and disease. His studies were almost entirely confined to the neuro-muscular apparatus. His method was one of simple clinical observation, without experimentation or very exact pathological findings. It is not too much to say that his followers have adhered to his method, and have not made much advance beyond him in the direction of what could be called accurate scientific work.

The defects of this method are numerous. The class of diseases to which electricity has been mostly applied by the followers of Duchenne includes the degenerative diseases of the spinal cord, nerve-trunks, and peripheral nerve-endings. The patients especially who are subjected to the current are those who suffer from acute or chronic anterior poliomyelitis, neuritis of traumatic or toxic origin, and sometimes the victims of ataxia and other systemic lesions of the cord. The morbid anatomy of these diseases is now fairly well understood. The clinical history and termination of many of them can be predicted with accuracy. It is, for instance, well within the bounds of probability that a facial paralysis due to neuritis will recover entirely, and that an infantile paralysis due to acute inflammation of the anterior horns will leave a residuum of palsy and wasting which may be permanent. The lesion in all these diseases is destructive. The repair is by a progressive building up of new tissue,—a strictly nutritive process, which requires time and favorable conditions, and cannot be done or assisted artificially, except in the most indirect way, as by the supply of food, hygiene, etc. Here is the gist of the whole matter. The question which forces itself upon the mind is whether galvanism or faradism can influence this process at all. Clinicians have answered this question almost unanimously in the affirmative, but there are dissenting voices of authority. It is hard to conceive how an electric current, applied hap-hazard on the skin of an arm or leg, can influence cell-growth in a nerve-trunk, or particularly in the spinal cord. Empirical methods and results are not to be altogether ignored, but it is, nevertheless, unfortunate that any therapeutic agent has to rely entirely upon an empirical record. This we think is the position of electricity to-day as applied to diseases of the motor apparatus, and justifies us in saying that the science has not advanced beyond where Duchenne left it.

The use of electricity in diagnosis by the

reactions of degeneration has been thus far its most exact scientific result; and while we believe this test is not as widely applicable as some have claimed, it is, nevertheless, now reduced to accepted formulæ which seem trustworthy and promise to be permanent.

In spite of what we have said, we think electricity, as a therapeutic agent, has a bright future in some departments of practice. We refer now to its dissolvent action by electrolysis. We wish to indicate here briefly a few cardinal principles upon which some of its advocates do not sufficiently rely, and of which some of its determined foes appear to be completely ignorant.

The power of a galvanic current to break up into its constituents a fluid medium, such as water, through which it may be passed, is one of the elementary facts of electrophysics. This power is exerted equally upon more complex fluids, such as solutions of chemical substances, and also upon organic fluids, such as blood, serum, milk, etc. Finally, it is exerted upon organized tissue. Thus water is resolved into hydrogen and oxygen, as may be readily observed upon passing a mild current through a tumbler of this fluid. In compound fluids or salts the acids seek the positive, while the alkaline bases go to the negative pole. The subsequent chemical actions of these acids and alkalies are just the same as would be the case if they were introduced from without, and constitute the secondary action of electrolysis. Now, the important point which therapeutists have too much neglected is this: that these changes are in exact quantitative relation to the strength and duration of the current,—that is to say, with so much current strength continued a certain time (or, technically, with so many *coulombs* of electricity), just so much hydrogen, oxygen, or whatever the simple atom or compound radicle may be, will be liberated. In such a simple fluid as water the figures of this problem are exactly known, but in such a complex series of organized tissues and fluids as exist in the human body (while, doubtless, the changes are just as constant and according to law) the figures are not known. It thus appears very evident that the power of electricity to break down organized tissue is not only indisputable, but that it may even yet be reduced to an exact dosage, and that it thus fulfils the first requirement of exact science,—conformity to law.

We are perfectly aware that electrolysis in surgery becomes a practical question,—*i.e.*, whether it can compete with the knife? Into this rather vexed question we do not propose here to enter. Several most important issues are involved. Can it be always controlled with perfect safety to surrounding parts? Is it expeditious, clean, and attended with little pain? Can it be rendered antiseptic, or is it already so? Several indications are imperative. The dose must be adequate and must be applied direct, and not allowed to diffuse widely through the skin and mucous membrane; hence puncture is probably always preferable. Finally, the dosage must be studied with care to supply data for reference. That certain fibroid tumors, bronchoceles, nævoid growths in vascular regions have been successfully treated in this strictly scientific way is without doubt.

THE EFFECTS OF EXTIRPATION OF THE PANCREAS AND THE CŒLIAC PLEXUS.

WE have on two previous occasions referred to the results obtained by Dr. Lépine as to the influence of the pancreas on the destruction of sugar in the organism. The drift of his views appears to be substantiated by numerous papers which have recently appeared, which point to the almost invariable production of diabetes mellitus after extirpation of the pancreas. Thus Von Mering (*Zeitschrift für Klinische Medicin*, Band. xvi., Heft. 5 and 6) found that after extirpation of the pancreas, a genuine diabetes is produced in dogs, corresponding to the severest form of this disease in man. Grape-sugar was excreted in large amounts, the appetite was abnormally great, polyuria was present, and, in spite of abundant feeding, progressive loss of weight and feebleness were invariably noted. Together with these symptoms, grape-sugar, acetone, acetoacetic acid, and oxybutyric acid were present in the urine, while there was increase of the sugar in the blood and decrease of the glycogen of the various tissues of the body.

Dominicis (*Centralblatt für Klinische Medicin*, June 7, 1890) has likewise produced permanent diabetes after extirpation of the pancreas, and he believes that disturbance of the digestive functions, brought about by the extirpation of the pancreas, leads to an alteration of the tissue-changes, which result in the production of diabetes. This is, however, a mere hypothesis, which the author does not attempt to prove, and which is by no means

as probable as the one suggested by Lépine and supported by Von Mering and Minkowski, which points to a specific function of the pancreas by which destruction of sugar is produced. Thus, Von Mering and Minkowski have found that if an animal is made diabetic by extirpation of the pancreas and fed with a definite quantity of grape-sugar, the whole of the grape-sugar is excreted in the urine, while if but a part of the pancreas be left, no diabetes is produced.

On the other hand, they state that these results are directly due to the removal of the pancreas and the prevention of the exercise of this specific function, and not to injury of adjacent parts, such as the solar plexus; thus Lustig, quoted in the *Medical Chronicle* for July, 1890, succeeded in removing the cœliac plexus from dogs and rabbits, and, although there was in some cases a temporary glycosuria, permanent diabetes was never produced.

This result was also confirmed by Peiper (*Medical Chronicle*, July, 1890). He never noted the production of diabetes insipidus, and only transient glycosuria in certain cases. Peiper's results are, therefore, opposed to the view that diabetes insipidus depends on the functional derangement of the cœliac plexus, and they also show that diabetes mellitus, following extirpation of the pancreas, is not attributable to injury of this plexus.

OXYGEN: ITS THERAPEUTIC HISTORY AND USES.

IT was but natural that when the properties of oxygen became known, it would be applied to the treatment of disease, and that the most extravagant expectations should have been entertained of this powerful vital stimulant. Its first medicinal applications were made in the treatment of phthisis. Priestly, in fact, shortly after the discovery of this gas, invented an apparatus for use in inhaling oxygen. Carllius, in 1782, was one of the first, if not the first, to treat phthisical patients by "dephlogisticated air;" in two cases he reported signal amelioration. Chaptal, Jurine, Bergius, and others, during the latter part of the last century, treated phthisis by oxygen inhalations, and noted that oxygen "ameliorated, calmed, and soothed, but did not cure;" in the words of Chaptal, "it smoothed the passage to the grave." In Fourcroy's nine cases "the respiration was facilitated, the expectoration restrained, the cough alleviated, but the fever seemed to be aggravated, and the hæmoptysis and emaciation promoted." This has been a frequent experience since Fourcroy's experiments; an acutely inflammatory, febrile condition seems to contraindicate the therapeutic employment of oxygen. Further trials at the beginning of this century showed that there was no curative benefit to be derived from oxygen inhalations in phthisis, and the new treatment fell into neglect, to be revived many years afterwards by Trousseau, Demarquay, Leconte, Read, A. H. Smith, Hayem, Albrecht, and others. Read recommends inhalations of 9 to 18 litres a day, cod-liver oil and alcohol to be taken at the same time. Hayem has shown that these inhalations arrest the vomiting of phthisical patients. Albrecht, whose trials date from 1881, has seen amelioration of cough, dyspnœa, and other distressing symptoms. His later reports affirm an arrest, in some instances, of the tuberculous process, with diminution of cough, dyspnœa, sputa, and the bacilli contained in the latter. Dujardin-Beaumetz, while not very enthusiastic on the subject of the oxygen treatment of this disease, pronounces the inhalations as harmless *per se*, and often highly beneficial in palliating certain symptoms.

In other affections of the thorax, oxygen inhalations are even of more signal benefit. Beddoes was one of the first to recommend them in asthma; he claimed some startling cures. Riadore also affirmed the curative virtue of oxygen in essential asthma; further trials, however, by other clinical experimenters have showed that these inhalations are only palliative; they certainly markedly alleviate and shorten the paroxysms. Masson, Constantin Paul, Demarquay, Huchard, Ball, Gubler have all made trials of this remedy in asthma, and attested to the benefits obtained. Dr. B. W. Richardson associates with these inhalations nitrite of amyl, and claims marvellous results. The respiration of 20 to 40 litres during a paroxysm generally suffices to relieve.* Gubler, however, contests the utility of these inhalations in pure asthma.

In chronic bronchitis with emphysema, and in whooping-cough, oxygen is said to be of real efficacy in calming the spasmodic element which accompanies these affections.

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* Dujardin-Beaumetz, "Dict. de Thérapeutique," article "Oxygen."

Dr. Richardson asserts that it does good by attenuating muscular irritability.

In the asphyxia of new-born infants, in asphyxia by submersion, by coal-gas, carbonic acid, and all deleterious vapors, in poisoning by hydrocyanic acid, strychnine, phosphorus, opium, oxygen by inhalation or intravenous injections is said to have produced remarkable results, and where, in these morbid conditions, oxygen inhalations can be resorted to, it would be unpardonable to neglect the means of treatment.

In diseases of the circulatory apparatus, accompanied by dyspnœa, oxygen inhalations give much relief; they do more good, according to Huchard, in aortic than mitral dyspnœa. In the dyspnœa of Bright's disease the beneficial effect of this remedy is very marked. Moreover, the disappearance of albumen from the urine under these inhalations in grave cases of Bright's disease is sometimes most remarkable; the amelioration is, however, not very lasting. This peculiar action of oxygen was first shown by Eckart, Constantin Paul, and Semmola.* In uric-acid gravel, oxygen inhalations, according to Ritter, cause a diminution in the uric acid of the urine.

With regard to the application of oxygen inhalations to diabetes, first recommended in 1865 by Durand-Fardel, while no curative benefit can be claimed for this treatment, yet amelioration of the principal symptoms has often been noticed, and it would seem to be a valuable adjuvant to other therapeutic measures.

Among the vital stimulants of use in chlorosis and anæmia, oxygen deserves a respectful consideration. It was first recommended by Fourcroy, afterwards by Beddoes, who affirms its reconstituent properties. Mellingen and Riadore, still later Demarquay, Hayem, and Regnauld, speak in high terms of the benefits of oxygen inhalations in the chlorotic and anæmic. "They restore the appetite, arrest vomiting, arouse the nutritive movements, and augment the weight of the body." Hayem calls oxygen the best adjuvant to iron in chlorosis or anæmia.

As for the mode of employment, the apparatus in common use is that of Limousin, or some modification of the Limousin apparatus. It is a wash-bottle in which the gas is passed through water; this wash-bottle is connected with a rubber bag, in which the gas is kept. The source of the gas is a mixture of chlorate of potassium and binoxide of manganese in a steel retort. The patient inhales the gas from the wash-bottle by means of a suitable mouth-piece and tubing.

Of late attention has been called to the external uses of oxygen, applied in the form of oxygenated water, of which the solution of peroxide of hydrogen of commerce is the type; it is a 15-volume solution. This solution is said to develop ozone in contact with diseased surfaces; its antiseptic properties are incontestable. It is employed in all cases where an active microbicide agent is required, being sufficiently diluted with water; in carbuncles, abscesses, foul (scrofulous, cancerous, syphilitic) ulcers, local gangrene, aphthous ulcerations, etc.

As for the solutions of ozone (so called), they are of very doubtful efficacy; while *ozonized air*—such as is found in nature's laboratory at the sea-side and on the mountains—is both bactericide and fortifying, and should be liberally tested during the hot season, especially by the debilitated and anæmic.

* Dujardin-Beaumetz, "Diseases of the Kidney," Am. ed., p. 142; also "Dictionnaire de Thérapeutique," article "Oxygen."

THE THERAPEUTIC PROPERTIES OF THE ANILINE COLORS.

AS is well known, Professor Kremianski some years ago advocated the employment of aniline as an inhalation in phthisis because of its great microbicidal power, and he has continued to employ this method, and claims for it considerable success. His views have obtained but little acceptation, it having been stated by various observers that the inhalation of aniline was very dangerous. In Germany especially his results have attracted considerable attention, and, as a consequence, the aniline colors have been made the subject of numerous chemical and therapeutic investigations, although the amount of contradiction which is to be found in the writings of various authors upon this subject render it very difficult as yet to form any positive conclusion as to the true facts in the case.

Professor Stilling, of Strasburg, devoted special study to the aniline colors and their employment in practice, and has, as we stated in a recent number of the GAZETTE, found that methyl violet possesses the highest degree of antiseptic power, and he claims that a one-tenth of one per cent. solution of this

substance could be injected under the skin of a guinea-pig to the amount of twenty cubic centimetres or more without causing any hurt to the animal. Half that quantity, however, if injected into the peritoneal cavity, proves fatal, the viscera, and especially the kidneys, with the exception of the Malpighian corpuscles, being colored blue. A few drops of the solution instilled into the eyes of rabbits colored the conjunctiva, but left the cornea—if this were uninjured—unaffected, the coloration disappearing the next day. Professor Stilling then employed this solution with marked success for the treatment of many eye- and other diseases, including scrofulous ulcers of the cornea, conjunctivitis, eczema of the lids, parenchymatous keratitis, serous iritis, disseminated choroiditis, sympathetic ophthalmia, whitlow, varicose ulcers of the leg, etc. A pure form of methyl violet for surgical purposes is now manufactured under the name of pyoktanin.

These results have, however, not been universally confirmed, and Dr. Mauthner, of Vienna, has just published a statement that he has been quite unsuccessful in his trials of this substance in a number of eye cases similar to those in which Professor Stilling has recorded such favorable results (*Lancet*, July 5, 1890). Dr. Carl (*Fortschr. de Med.*, 1890, No. 10) has likewise failed in obtaining satisfactory results. He experimented at first with fuchsin, gentian violet, methyl blue, and finally methyl violet for several months. He has employed the watery solution of methyl violet as an isolation in the eye in the treatment of affections of the conjunctiva, and as a local application, by means of thin camel's-hair pencils, to ulcers of the cornea. In affections of the conjunctiva he has found the methyl violet to be absolutely inert, while in infiltrated and superficial ulcers of the cornea, although methyl violet has seemed to somewhat reduce the signs of irritation, no such effects as claimed to follow its employment by Stilling, were ever observed; and since he employed atropine, in conjunction with the aniline colors, it is very doubtful as to what share is to be attributed to the latter. Besides, he reports a case of serpiginous ulceration of the cornea where methyl violet appeared to aggravate the course of the disease.

Dr. Braunschweig has likewise published results which tend to reduce the enthusiasm which might be expected to follow Stilling's work (*Gazette Médicale de Paris*, No. 24, 1890).

Dr. Braunschweig experimented as to the antiseptic properties of the aniline colors in the ophthalmological clinic of Professor Grafe, of Halle, and although he found that their instillation in the eye gave no symptoms of poisoning, yet solutions of these coloring-matters always produce a slight sensation of burning, which, although in some instances only lasting for a few moments, in other cases persisted for a quarter of an hour or more, and became so violent that an application of cocaine was necessary to produce relief. In cases where the conjunctiva was perfectly healthy, the application of the aniline colors was always followed by a sensation of burning, even when lightly touched with a pencil containing the coloring-matter. Sometimes also pronounced ciliary injection was produced, with hyperæmia and considerable tumefaction of the conjunctiva, and in three cases of parenchymatous keratitis these conditions were especially marked.

In some cases treated with yellow aniline (auramine) yellow vision was produced, evidently due to the rapid diffusion of the coloring-matter in the aqueous humor and vitreous body, and lasted for about half an hour.

Braunschweig, in summing up his results, groups his cases into three different classes.

The first group is by far the smallest, and in this he claims that some salutary effect was obtained. One was a case of panophthalmia, which was evidently improved by the employment of methyl violet. So also a case of ciliary blepharitis was likewise favorably influenced by this substance.

The second group comprises (the majority of the cases) those cases in which the influence of the medication was absolutely negative, while the third group comprises those cases where the application of the aniline colors produced aggravation of the ocular disturbance. Thus, in cases of conjunctivitis with abundant secretion, pseudo-membranous infiltrations were observed in many cases, while symptoms of parenchymatous keratitis and trachoma, in which the conjunctiva was normal, became complicated with conjunctivitis.

It is, however, from the point of view of antisepsis, or as bactericides, that the aniline colors have attracted especial attention; and although Janicke (*Gazette Médicale de Paris*, No. 26, 1890) has found that most of the aniline colors, especially the methyl violet, possess considerable microbicidal properties, yet even the

antibacteriological action is considerably reduced when exerted upon micro-organisms suspended in blood serum, a fact which very largely detracts from any practical application of these substances as bactericides; and although it has been found that the solution of these coloring-matters gave good results as disinfectants for the hands and instruments, the process of coloration is a marked disadvantage; but, on the other hand, the occurrence of the coloration may be regarded in some respects as an advantage, as it enables us to determine the contact of the disinfecting fluid with the surface which it is desired to disinfect, so that perhaps then the field of usefulness of these coloring-matters will be restricted to the disinfection in dilute solution of wounds, abscesses, and various cavities of the body where ocular evidence in the production of disinfection will be obtained in the blue coloration produced.

Dr. Petersen, of St. Petersburg, publishes in *Wratsch*, 1890, No. 20, the results of his experiments as to the antiseptic action of the aniline colors in forty cases of venereal affections, and he has found that, whether employed in the form of a powder, 2 parts to 1000, or in a solution 1 to 2000 or 1 to 1000, in the treatment of venereal ulcerations results have been obtained by means of the aniline colors which are quite comparable to those produced by iodoform, while the disagreeable odor of the latter is wanting. So also in cases of soft chancre, gummatous ulcerations, and syphilitic or gonorrhœal ulcers, the results are claimed to have been satisfactory.

Bresgen (*Deutsche Medicinische Wochenschrift*, 1890, No. 24) has employed the aniline colors as topical applications after the use of the actual cautery or chromic acid on the mucous membrane of the nasal chambers, and he claims that they produce a salutary influence on the inflammation and suppuration consecutive to the cautery, and he believes that their employment reduces the duration of the treatment by means of caustic applications.

Finally, Professor Sée and Dr. Morau (*La Médecine Moderne*, July 10, 1890) published the results of their experiments as to the antiseptic power of the different aniline colors and as to their therapeutic applications, and they claim that the aniline colors of the aromatic series, when deprived of phenol and arsenic, are not toxic.

Their antiseptic power they find to vary in different instances. The most active in this respect being malachite green, methyl violet, and safranine, while in very dilute solutions, 1 to 2500, they find that they favorably modify suppuration, and in certain cases may prevent its occurrence. Thus, for example, they report a case of tonsillitis in which a commencing suppuration appeared to be aborted by the application to the tonsils of a solution of malachite green 1 to 2500 in strength.

Reports on Therapeutic Progress.

NEW METHODS FOR THE TREATMENT OF ACUTE GONORRHŒA.

In an essay with the above title, published in the *Zeitschrift für Therapie*, May 15, 1890, Dr. Kopp publishes his own experience, and an analysis of some eighty different papers, which were published on this subject in the last few years, beginning with the consideration of the prophylactic measures recommended by Hausmann.

This method, which the author designates as rational, but as impracticable, consists in the injection of a one per cent. solution of nitrate of silver, or an equally strong solution of corrosive sublimate, into the fossa navicularis, so as to disinfect the locality in which gonorrhœa must first start.

Welander's abortive treatment, which consists in rubbing vigorously the internal surface of the urethra with pledgets of cotton, and then immediately pencilling the interior of the fossa navicularis with a two per cent. solution of nitrate of silver, only, in the author's hands, succeeded in a very few cases in aborting gonorrhœa within twenty-four hours after the injection. While the use of a ten per cent. solution, as recommended by Daday, is very properly regarded by the author as an extremely dangerous method, and one which is apt to cauterize the urethra up to the juncture of the bulbo-membranous portion.

If the time for abortive measures is past, Dr. Kopp recommends mild antiphlogistics, rest, regulation of the diet, treatment of the symptoms as they arise, either by internal medication or injection. His experience in the employment of internal measures in gonorrhœa has been very unsatisfactory, although he admits that the remedies recently recommended, such as the calcium sulphide, kwa-kwa, etc., have not been enough tried to warrant giving an opinion as to their value. So also in the case of the East Indian sandal oil, so warmly recommended by some author-

ities, he has been unable to testify as to any favorable influence either in acute or chronic gonorrhœa. His views on the subject are, that gonorrhœa is an eminently local inflammation, and it, therefore, can only be successfully treated by local measures. He has tested solutions of boric acid, potassium permanganate, ten per cent. solutions of iodoform oil, lime-water, boro-glycerin, pyrodin, peroxide of hydrogen, hot injections of quinine, sulphur oil (?), eucalyptus, potassium carbonate, etc., but none of them seem worthy of confidence, and he states that he was only satisfied with the injection of dilute nitrate of silver after preliminary hygienic measures had been employed, when the quantity of the discharge commenced to decline. In some of his cases the discharge ceased within eight to ten days.

He has obtained very little success from the use of sublimate injections, and likewise the sublimate bougies have proved unsuccessful in his hands.

Resorcin, in three to four per cent. solution, seems to promise good results, but it has not been sufficiently employed to admit of any conclusions as to its value. Sulphate of thallin, in two and a half per cent. solution, or as thallin antrophores, are likewise, in his opinion, absolutely worthless in the treatment of acute gonorrhœa.

THE PROPHYLAXIS OF CONTAGIOUS DISEASES.

According to the Paris correspondent of the *Medical Press and Circular* (June 18, 1890), at the Académie de Médecine, M. GRANCHER (Pasteur's principal assistant) spoke at great length on the prophylaxis of contagious maladies, which he considered to be one of the most important questions of contemporaneous medicine. To realize this influence we have two means at our disposition,—isolation and antisepsis. In surgery and obstetrics, he says, antiseptics seemed sufficient, as the problem is relatively simple, since it is reduced to the protection of a wound. In medicine, the question is more difficult, and isolation was the method recommended and employed by the majority of medical men. But there is *isolation* and *isolation*—as was well perceived by the physicians who had charge of children's hospitals in the matter of the special wards for diphtheria and measles—which did not render the services anticipated. At the Hôpital des Enfants Malades in Paris, for instance, the contagion of diphtheria and measles did not diminish consequent on the creation of special wards. Certainly the number of external cases diminished in the general wards, but the germs of these two affections kept up by contagion the rate of morbidity and mortality. The efforts against contagious diseases, consequent on the method of isolation, have not been crowned by the success desired, and M. Grancher thought that medical antisepsis would render very signal services. Isolation could never suppress all chance of contagion, and without antiseptics it would, on the contrary, create a new source of danger,—as when patients suffering from the same malady are packed together in the same ward, the secondary affections of that malady or its complications would become multiplied. In the measles wards M. Grancher found that broncho-pneumonia and diphtheria raged with intensity, creating thus the true danger of the primitive affection. Fully convinced of this fact, he wrote in 1888 to the hospital administration, asking for three things,—a perforated metallic screen, a wire basket for each bed, and a supplementary nurse for each ward. The screen was folding, and surrounded the bed so that each child was isolated completely from the others, and yet not entirely deprived of their company, as the perforations were large enough for it to see all that was going on around it. The wire basket had for object the easy disinfection of all the plates, cups, etc., which were used by the patient. When the nurse brought the child its food, she spread on the bed an india-rubber napkin, and the repast finished, the whole was taken away in the basket and plunged as it was into boiling water. The supplementary nurse had sole charge of all the children placed thus in quarantine, and was not allowed to go near any other. By this method he obtained a reduction in the number of internal cases of contagion, but this reduction was much more marked in diphtheria than in measles.

THE PHYSIOLOGY OF THE RECURRENT NERVES.

At the meeting of the Société de Biologie, held May 31, 1890, DR. LIVON, Professor in the Medical School of Marseilles, made a communication as to the physiology of the recurrent laryngeal nerves (*La Tribune Médicale*, June 5, 1890).

In spite of the numerous works published

on the physiology of the laryngeal muscles, the question as to the innervation of these muscles has not yet been elucidated, and the greatest divergence exists in the opinions of different physiologists as to this point. It is only sufficient to refer to the most recent works on physiology to notice how different are the opinions of various authors as to the *rôle* played by the recurrent nerves, the principal source of supply of the motor nerves of the larynx.

Thus Donaldson admits that stimulation of the recurrent nerves invariably gives, with a feeble current, either slowly or rapidly interrupted, dilatation of the glottis, and that occlusion is always produced by strong currents, whether slowly or rapidly interrupted.

Franklin Hooper, on the contrary, attributes an important *rôle* to the degree of rapidity of the interruption; according to him occlusion is produced more rapidly by increasing the number of vibrations than by augmenting the intensity of the current.

Dr. Livon, in renewing the investigations on this subject, to avoid error caused all variations in the glottis to be automatically recorded, his experiments being made upon the dog, the animals being anæsthetized by intraperitoneal injections of morphine and chloral, the trachea sufficiently opened to permit of easy respiration, and then a little rubber bag introduced between the vocal cords, the rubber bag being connected with the registering lever. Thus it is a simple matter to register the time and rhythm of excitation of the glottis. The tracings which the author so obtained seem to establish that with a feeble excitation of 18 or 20 interruptions a second there is rhythmical contraction in the muscles of the glottis, with dilatation of the latter, the same rhythm with a moderately strong current produces the same result, while the same current with an extremely rapid rhythm produces complete occlusion.

If during a single stimulation the rhythm of the interruptions is varied, the effects produced are different even with intense currents.

Slow interruptions produce isolated muscular contraction, with tendency to dilatation; repeated interruption causes occlusion, with persistence of muscular contraction.

If with a rhythm of 25 to 30 the intensity of the current is varied, the occlusion becomes more and more complete.

The first result obtained is not dilatation, but slight, distinct muscular contraction, and then occlusion commences.

Again, in varying the rhythm of the stimulation of the recurrent nerves, there is produced distinct dilatation or absolute occlusion. Livon, however, adds that in the numerous experiments which he has made he has never been able to obtain simple dilatation of the glottis without muscular contraction isochronous with the stimulation.

TREATMENT OF CYSTIC GOITRE, RANULA, AND OTHER CYSTS WITH CHROMIC ACID.

In the *Lancet* for June 21, 1890, Dr. Edward Woakes describes what appears to us to be an entirely novel method of treating certain cysts. The method suggested itself to him by his experience about six years ago, when he had under treatment a woman, aged 50, for fibro-cystic goitre involving the right lobe of the thyroid body. The cyst, which extended to within an inch of the angle of the jaw, had been tapped and injected with concentrated solution of tannin, with the result of securing apparent obliteration of the cavity. She continued under occasional observation while the fibrous portion of the tumor was dealt with, when, after an interval of some months, it became apparent that the cyst was refilling. In the course of a few weeks the contents, consisting of a thin purulent fluid, found an exit through the cicatrix left after the original tapping, with the consequent formation of a sinus, through which the offensive fluid continually issued. Thus was established the exact nuisance which the method originally adopted was designed to obviate. The difficulty of treating the cyst through the sinus was increased by the fact that during the lengthened absences of the patient, a portion of its now tortuous course passed through recently-formed and still growing hypertrophic gland-tissue. Under these circumstances Dr. Woakes adopted the plan of passing a probe, previously dipped for three inches of its length into a saturated solution of chromic acid, through the sinus into the cyst cavity. This was done several times in three successive weeks, when, after an interval of non-attendance of some five weeks' duration, a brown, tough material was found protruding from the wound. Traction on this drew out a rolled-up mass of the same substance, which when spread out had the appearance of leather, and was about the size of the palm of one's hand. It was undoubtedly the wall of the cyst, altered and probably destroyed by contact with the chromic acid,

and thereafter got rid of as described. It is needless to state that after this deliverance the cystic part of the trouble was ended. The enlarged isthmus and right lobe of the thyroid body required a period of further treatment, but ultimately recovered. It should be understood that no such extrusion of a well-formed cyst wall occurred in any subsequent case treated on the basis furnished by that just recorded, a divergence due no doubt to the improvement in the method of using chromic acid adopted as the outcome of this first crude experiment. In fact, the original cyst wall in the foregoing case had been converted into a pyogenic membrane by the early treatment, and this, being deprived of its vitality by the action of chromic acid, was at a later period cast off by the adjacent healthy tissue.

Shortly after the conclusion of the preceding case,—that is, in October, 1884,—a very similar one as regards situation and size occurred in the person of a younger woman, aged 30. Dr. Woakes had not at this time realized sufficient confidence in the use of chromic acid, so proceeded, as in the former instance, to tap and inject solutions of tannin. The purulent contents were evacuated on the fourth day. No attempt at adhesion or even of diminution of the cavity followed; the cyst was simply changed into an abscess, which discharged through the trocar wound. As no sign of improvement was apparent after three weeks, a canula (without the trocar) was reintroduced, and the cavity carefully emptied of its contents. Instead of the probe dipped in acid and passed through a sinus, it was now practicable to introduce it through the canula. This was done by means of the "acid carrier," an instrument which holds a definite quantity of the fluid at its distal end, and enables the operator to apply the acid directly to the boundaries of the cavity. This being done, the patient was directed to keep her bed, and to apply ice if any trouble followed. Nothing, however, occurred, and at the end of a week adhesion was complete. There has been no return of the cyst since.

In the third case, also a female, there existed fibro-cystic enlargement of the left lobe. Supported by the foregoing experiences, it was resolved to treat this case solely with the chromic acid. The cyst was tapped with the trocar and canula, and when empty, without withdrawing the latter, the "carrier" charged with chromic acid was introduced through it, and applied directly to the cyst wall. On the fourth day, the wound being still open, although the tumor was shrinking satisfactorily, it was deemed desirable to introduce more acid, which was done without the intervention of the canula. This was probably an unnecessary precaution, as the cyst disappeared from this time, and the wound healed rapidly.

The next case came under treatment in the early part of 1889. The patient was a male, aged 30. Inasmuch as a second cyst appeared at a widely distant part of the goitre from that first treated, it may be regarded as furnishing two examples of this method of dealing with cysts. The right lobe was dense and fibrous, while a small but prominent cyst occupied the middle line, and was clearly connected with the isthmus of the thyroid body. It was tapped, when about six drachms of clear straw-colored fluid escaped. The acid was then applied exactly as in the preceding case. The wound was closed, and the patient kept in bed for three days by way of precaution. There was absolutely no symptom, and at the end of a week no trace of the cyst could be detected. After an interval of a month the patient returned for treatment of the hypertrophied right lobe, when a second cyst was observed on the outer border of the tumor, just above the clavicle. Although fluctuation was distinct the amount of fluid was small, and the swelling formed by it was rather broad than prominent. It was, however, tapped, when two drachms of fluid escaped, and was followed by rather free bleeding. On cessation of the latter the acid was introduced as before. The wound healed at once, but the cavity refilled very rapidly, owing, as it seemed, to the acid having been neutralized by the blood remaining in the cavity before reaching its boundaries. The operation was repeated after a few weeks, with the result of securing an equally rapid obliteration of the second cyst, as was witnessed in that connected with the isthmus. So complete was the disappearance of this cyst that its former site was selected on account of its accessibility—outside the edge of the clavicular portion of the sterno-mastoid muscle—for introducing the needle of the hypodermic syringe in the later treatment of the fibrous portion of the disease by means of injections of tincture of iodine. The negative results of the first operation, due to the presence of blood in the cavity, needs only to be recalled to suggest its proper lesson.

Some twelve months previously to the attendance of the last-related case, in 1888, a

young butcher, aged 20, presented himself at the out-patient clinic of the London Throat Hospital for the treatment of a large ranula. This occupied the right side of the floor of the mouth, nearly filling that cavity, and further projected below the jaw on this side, as a large elastic swelling the size of a hen's egg. The case had been already under treatment in a provincial hospital, where, on two occasions, portions of mucous membrane had been excised with the usual unsatisfactory experience. No sooner did the wound heal than the swelling returned. Under these circumstances the remarkable efficacy of chromic acid in bringing about the abortion of cysts naturally occurred, and it appeared justifiable to adopt a similar course in the present instance. Accordingly a small incision was made in the most prominent portion of the tumor in the mouth, and through it the thick gelatinous contents were carefully evacuated. There was no bleeding. Explored with a blunt probe, the cavity was found to extend under the tongue almost to the opposite jaw. The wound gaped freely, and allowed the carrier charged with solution of chromic acid to be applied to its inner surface. Probably not more than five drops of the solution were thus introduced. The patient was put to bed, a precaution which again proved unnecessary, as no sign of irritation, either local or general, followed. At the end of a week there was no trace of swelling or enlargement of any kind. It was possible, however, to introduce a probe, with some persuasion, for a short distance into the wound; all beyond this point was firmly adherent. Although probably a superfluous proceeding, it was deemed expedient to reapply the acid to this sinus, after which it rapidly healed over, every trace of the disease having disappeared in less than a fortnight from the commencement of the treatment. Some two or three weeks later the patient returned for inspection. He was then quite well, and has since remained so.

Whether the treatment of ranula by chromic acid has been adopted by others, either before or since the occurrence of the case just quoted, is uncertain, but if this plan should prove to be a new departure, one successful example is insufficient evidence on which to recommend any new method of treatment. This instance is introduced here with the hope that it may convey a serviceable suggestion to some member of the profession whose experience of the disease, when treated on the ordinary lines, may have proved unsatisfactory and disappointing.

Regarding the precise action of chromic acid on the walls of cysts, or, indeed, on living organized tissues generally, it does not appear that any very exact evidence exists. Repeated observation points to the complete and rapid amalgamation between the tissues and the acid itself, to such an extent that thereafter neither the one nor the other retains its former physical characters. This is especially the case with the acid, and constitutes its chief recommendation for the uses to which it is usually put, and which uses appear to be by no means exhausted. Should the author's experience in the direction indicated in this paper meet with corroboration, it does not seem improbable that the ingenuity of surgeons working in a wider field may find in it a useful substitute for more heroic methods, when the object sought is to bring about the obliteration of cavities, the chief obstacle to which is the secretory proclivities of their limiting walls.

A CASE OF EXTREME SLOWNESS OF THE PULSE.

In the *Centralblatt für Klinische Medicin* for June 7, 1890, Dr. Gilbert, of Dresden, adds another case to the collection published by Dr. Prentiss in a recent number of the Therapeutic Gazette. The case was that of a widow, 60 years of age, who had for a long time been treated for tertiary syphilis. She had cutaneous and osseous evidences of the disease, but no brain symptoms, and she had always taken potassium iodide with success. On March 15 she complained of stabbing pain between the shoulder-blades, cough, depression, and loss of appetite. There was found to be slight pleurisy on the right side and bronchitis. She was put in bed, poultices applied, and iodide of potassium given internally. There were no heart symptoms, no vomiting nor dizziness. Two days later, the pulmonary symptoms having greatly improved, and no other morbid symptoms being present, there appeared a gradual slowing of the pulse to 30 to 32 beats in the minute. Percussion did not show any enlargement of the heart, and the sounds were perfectly normal, the radial arteries were somewhat tortuous and rigid, the pulse was regular, full, and occasionally dicrotic; there was no fever.

On the next day, in spite of continued improvement in the catarrhal symptoms, the pulse had fallen to 22, was small, and dicrotism was no longer noted.

On the following day, as a result of free administration of wine and camphor, the pulse increased to 24 beats, but still remained very small. At the same time the sensorium became affected, diarrhœa, profuse sweating, and, finally, incontinence of fæces and urine took place.

On the next day—that is, six days after the first day the woman was seen—the pulse was 20 to the minute, and continued so until death.

Dr. Gilbert adds that the pulse was perfectly regular up to the last. The subjective symptoms, so long as the mind was clear, consisted of shortness of breath, dizziness, and increasing weakness. The lungs and heart were repeatedly examined both by the author and Dr. Meinert, and there were no heart murmurs then detectable, and only slight catarrhal symptoms in the right lower lobe of the lung.

The probable diagnosis, although the author admits that it was extremely doubtful, was gummatous tumor of the brain. Dr. Gilbert also alludes to a similar case published by Dr. Bohm in the *Centralblatt für Klinische Medicin*, No. 20, 1890.

BRAIN SURGERY.

At the meeting of the Royal Academy of Medicine in Ireland, held May 9, 1890, Mr. Thornley Stoker read a paper, in which he reported two cases of brain-disease on which he had operated (*British Medical Journal*, June 28, 1890). The first was a case of abscess in the right temporal lobe, depending on disease of the ear. Pain, retraction of the head, and right anosmia were the leading brain symptoms. On March 9, 1890, the brain was exposed with the view of exploring the cerebellum, if pus should not be found in the temporal lobe. The trephine opening was placed, with the purpose of exposing the second temporal convolution, with its centre one inch and a quarter behind the external meatus, and one inch and a half above this base line. Mr. Thornley Stoker spoke of the mistake made by Mr. Barker in placing the point to expose the second convolution too low down,—namely, one inch and a quarter above the base line; and he demonstrated, by a number of Professor Cunningham's models and drawings, kindly lent for the occasion, that the point indicated by Mr. Barker could only expose at highest the inferior convolution, and might even endanger the lateral sinus. He expressed his intention in future of operating one inch and three-quarters above the base line, at which height only there would be reasonable certainty of exposing the second convolution. Nine exploratory punctures were made in different directions, and on the ninth, at a distance of one inch and a half from the surface of the brain, pus was found, to the amount of two or three drachms, lying above the tentorium, in a direction downward, inward, and backward from the trephine opening at the junction of the under surfaces of the temporal and occipital lobes. The patient was now, three months after trephining, doing well. Although she had lost several drachms of brain matter by sloughing and by the removal of a hernia cerebri, she suffered no paralysis or impairment of any kind, the sense of smell being restored and all her symptoms relieved. The second case was one of a spindle-celled sarcoma, of small size, situated in the superior and back part of the right parietal lobe of a man, aged 42. It had given rise to tonic spasms of the left side, commencing in the leg and gradually invading the trunk, upper extremity, and face. Spasm was followed by paralysis, occurring in the same order from below upward. The leg and arm centres were exposed, but the tumor was not discovered, as it lay at the extreme back of the leg centre, and was of the same consistence as the brain substance, so that instruments passed through it without resistance. The removal of pressure afforded by the operation gave temporary relief. The patient, who was nearly comatose and quite hemiplegic, recovered consciousness and partial power in the side, but died three weeks afterwards. The chief points of interest in the case were: 1. The irregular position of the spasms, which sometimes engaged the upper extremity without the lower, although the tumor proved to be remote from the arm centre. Mr. Thornley Stoker dwelt on what he termed "referred" pressure, as an important and confusing factor in such cases. 2. That the position of the tumor pointed to the extension backward of the leg centre into what had been regarded as a doubtful region. 3. That the case showed the leg centre to be behind that for the thigh. 4. The absence in this instance of three of the four classical symptoms of brain tumor,—namely, optic neuritis, fixed headache, and vomiting; only the fourth, hemispasm, being present.

THE INFLUENCE OF COCAINE ON MUSCULAR CONTRACTION.

Nearly all authors who have studied the physiological action of cocaine are in accord with Anrep in admitting that it does not exert any influence on the muscular system, and Kobert, in viewing its action on frogs, affirms that in small doses cocaine is without action, while in large doses it increases muscular contraction.

Frend, in 1885, in experimenting on a man, admits that cocaine has no direct action on muscles or motor nerves, but exercises an indirect action by placing the organism in a most favorable condition for liberating energy.

Berthold, on the other hand, claims that this drug possesses a paralyzing action on the muscles of the frog, which he interprets as simply due to fatigue.

Almes found in the frog an insignificant diminution in the muscles submitted to the action of cocaine, while, according to the most recent work of Feinberg, the reaction of the muscles and nerves of the dog is undisturbed by the action of cocaine.

This rapid sketch as to the views of different authorities on this subject shows that there is still considerable uncertainty as to the action of cocaine on the muscular system, and one might believe that in this respect muscles differ from protoplasm in general; in fact, the experiments of Kratizki on the paralyzant properties of cocaine shows that cocaine arrests the movements of the mimosa pudica and paralyzes the protoplasmic amœba and white blood-corpuscles and arrests the movements of cilia.

Dr. Aducco, in his work on the functions of the spinal cord, likewise mentions that he has observed the same effect in vorticella and other protista, and that under the influence of cocaine he has seen all protoplasmic movement of the infusoria arrested.

In order to throw further light on this subject, Dr. Ugolino Mosso has made a large number of experiments on the muscles of the frog, the dog, and man, and his results are published in the *Journal d'Hygiene* for June 12, 1890.

The author believes that his experiments warrant him in concluding that, after prolonged exercise, cocaine has considerable power in re-establishing the normal conditions, whether of voluntary contraction or of contraction under mechanical stimulation of the fatigued muscles. 1½ grains of the hydrochlorate of cocaine, according to the author, suffices to almost double the amount of work accomplished by voluntary contraction, and that under these circumstances the sensation of fatigue will entirely disappear. The author, therefore, believes that cocaine, independent of its action on the nervous system, exercises a direct action on the muscles; although in small doses it augments their contraction, in large doses it diminishes them. For this reason the author does not admit the hypothesis of Dr. Baldi. He would explain the mechanism of the action of cocaine as attributable to its producing a greater resistance to fatigue. Finally, the author maintains that cocaine administered to man in doses sufficient to do away with the sense of fatigue not only does not obtund sensibility, but even exaggerates it, and the author states that he is at present engaged on a study of cocaine, which seems to show that cocaine in small doses tends to increase sensibility, especially tactile, while at the same time shortening the time of physiological reaction, accelerating the pulse and respiration, and greatly increasing the quantity of inspired air.

THE ABORTIVE TREATMENT OF GONORRHŒA.

According to the Paris correspondent of the *Medical Press and Circular* (June 18, 1890) M. Malècot has devised and recommended the following method for abating an acute attack of gonorrhœa: After making the patient micturate, and washing his urethra out with a weak boric-acid solution, the author injects an ordinary syringeful of a 1 in 50 solution of nitrate of silver, and on the following days 1 in 100, or even 1 in 150. The solution is allowed to remain two or three minutes in the urethra. At the same time as the injections are being used, the author prescribes frequent injections of some antiseptic solution. He prefers the following: .05 centigrammes of salicylate of mercury in 100 grammes of water, at a temperature of 30° to 40° C. A cotton tampon impregnated with the antiseptic should be kept fixed in front of the meatus urinaris, so as to absorb the pus as it escapes, and the tampon should be changed as soon as it is soiled. From six to eight sandal-wood-oil capsules are also prescribed for a dose. As the result of this treatment, the author states that he has often obtained successfully, and without ill consequences, the cessation of an

attack of gonorrhœa, even when there was a profuse flow of pus in from three to four days.

THE BROMIDE OF ETHYL AS AN ANÆSTHETIC.

Quite a number of articles have recently been published on bromide of ethyl as an anæsthetic, which seem to indicate that this agent is again acquiring a certain amount of repute in minor surgical operations. In the *Journal de Médecine de Paris* for June 15, 1890, is an abstract of a number of papers from various authors advocating the use of bromide of ethyl as an anæsthetic.

SZUMAN and THORN confirm the experience of Asch and Pauschinger as to the applicability of this substance for the production of anæsthesia in slight operations not lasting more than a few minutes and in practical obstetrics. They recommend to apply a chloroform mask directly to the nose and mouth, and to moisten this with ¾ to 1 ounce of the anæsthetic. With this amount of anæsthesia painful sensation is completely suppressed, while tactile sensibility and consciousness are generally preserved. Dr. Szuman goes still further and recommends the employment of bromide of ethyl in graver operations as in the extirpation of goitre or ovariotomy.

Dr. Gilles, of Cologne, is stated to have applied the bromide of ethyl in more than four hundred and fifty cases of operation on painful teeth, and has come to the conclusion that we possess in the chemically pure bromide of ethyl an excellent anæsthetic, acting with promptitude and certainty, and, when carefully administered, without danger, and an anæsthetic which cannot be too highly recommended to dentists, as it is superior to chloroform, nitrous oxide, cocaine, and all other anæsthetics. In order to obtain complete analgesia, Szuman and Gilles are in accord that the bromide of ethyl should not be poured upon the anæsthesia mask drop by drop, but that the cloth should be thoroughly saturated, and then closely applied to the mouth and nose, since the simultaneous inhalation of air in any quantity greatly diminishes the effect.

The amount of bromide of ethyl required to produce complete anæsthesia will rarely exceed 150 to 300 drops. The effect is evident in half a minute, while in children even a smaller quantity will produce anæsthesia in about fifteen seconds. It is stated that these authors have observed no secondary dangerous symptoms, especially no diminution in the pulse, and no difficulty in respiration.

THE PROPERTIES OF SODIUM SILICO-FLUORIDE.

It is about two years since sodium silico-fluoride was introduced as an antiseptic agent, apparently constituting the trade-marked antiseptic "salufer," and although this double salt has been more or less extensively used, but little evidence has been brought forward as to its chemical properties and physiological action. The readers of the GAZETTE are already familiar with most of the papers which have been published on this subject, and to them may be added some notes published by MR. E. LLOYD JONES in the *British Medical Journal* for June 21, 1890.

Mr. Jones was led to the study of this substance in some experiments having for their object the sterilization of pancreatic digestion solutions, and, after trying a number of the more prominent germicides, he employed a sample of "salufer." He found at the end of a few days that the digestive solutions to which this substance had been added were some of them absolutely putrid.

The digestions were made in two ways,—either a two per cent. solution of sodium bicarbonate was taken, and the silico-fluoride subsequently added to saturation, or a known volume of the saturated solution of sodium silico-fluoride was taken, and sufficient sodium carbonate added to produce a two per cent. solution.

In the first case the digestion remained aseptic; in the second there was effervescence as the sodium carbonate was added, and the digestive fluid became offensive at the end of a few days. In the first case the total fluorine was much greater than in the second, existing probably in part as fluoride of sodium, and in part as unaltered silico-fluoride. In the second case the silico-fluoride became converted, on the addition of the sodium bicarbonate, into the silicate and fluoride of sodium, and so little silico-fluoride remained that it was not sufficient in amount to act as a germicide.

It was suggested by Thomson, who discovered the antiseptic action of the fluorides, that surgeons who placed their knives in solutions of sodium silico-fluoride should add a little carbonate of sodium in order to prevent

corrosion of the steel. Such a procedure appears, in the light of the above facts, to be more than questionable.

With regard to the mode in which the salt acts as an antiseptic, the following facts may prove of interest.

In order to preserve a five per cent. solution of serum albumen in saline solution, an unmeasured quantity of silico-fluoride was added. After a few days the solution was clearer and free from a hazy turbidity previously noticed, but no trace of proteid was detected in the supernatant liquid. This effect Mr. Jones has never been able to reproduce in the same degree, although a saturated solution of the salt slowly and partially precipitates serum albumen, egg albumen, and paraglobulin from their solutions. In fact, a saturated solution proves an exceedingly delicate test for these proteids. With a saturated solution of the salt, albumen was detected in a sample of urine containing casts, which only gave a reaction with trichloracetic acid on mixing, and with picric acid by the contact method, and which gave none on boiling with the addition of a drop of acetic acid, nor with an equal volume of picric acid, nor with acid brine, nor with the cold nitric acid test. The worst objection to its use as a test is that it must be used by the contact method, and that the drug varies a good deal in composition. Some specimens were acid, others neutral, and the majority alkaline.

While the saturated aqueous solution precipitates some proteids, there is yet another effect of the solid salt akin to that of certain other inert powders. M. Boymond pointed out that the filtration of a solution of serum albumen through bismuth trinitrate sufficed to remove the proteid from its solution, and Mr. Jones finds that upon leaving a solution of serum albumen in contact with an underlying layer of fine sulphur a jelly-like layer of proteid separates out and can be seen lying upon the sulphur, while the supernatant fluid is clear. Sodium silico-fluoride appears to act in this twofold manner, and one or both of these properties appear to offer a possible explanation of its antiseptic action, especially as similar precipitants of proteid—as alcohol, mercuric chloride, picric acid, etc.—are generally antiseptics.

With regard to its internal administration, Mr. Jones corroborates the results of those who describe it as not so innocuous as it has been represented. A single dose of 2 grains produced in one case discomfort and nausea. ¼ of a grain thrice daily, exhibited for some weeks, produced, however, no ill-effects.

It appears not unlikely that it may be decomposed within the body in the same way that it is by sodium carbonate, glass, etc., and that after absorption it is as useless as an "internal germicide" in infective disorders as it is in certain cases in the laboratory.

THE PHARMACOLOGY OF THE CAMPHOR GROUP.

The experimental investigations of Heubner, Hoffman, and Wiedmann have yielded a large number of facts as to the physiological action of chloroform. As a result of the studies of these different observers, it has been found that camphor produces at first generalized convulsions, which are, however, only observed in warm blooded animals, and then paralysis of the terminal extremities of the motor nerves, comparable to the action of curare, and a direct stimulation of the heart, which is observed only in cold-blooded animals.

Camphor likewise produces an increased blood-pressure, attributable to stimulation of the vaso-motor centres of the medulla oblongata. In the *Archiv für Experiment. Pathologie und Pharmak.*, vol. xvii., No. 3, 1890, Dr. Lewin has continued the investigation of the action of camphor on the heart, both in warm-blooded and cold-blooded animals.

He has experimented on the isolated heart of the frog and on dogs and rabbits under the influence of chloral, blood-pressure being reduced to its minimum and the pneumogastric nerves being cut. He has found in dogs and rabbits so prepared for study that the administration of camphor by the stomach or by injection into the veins produces a considerable reduction of blood-pressure, a proof that camphor exercises a direct influence on the heart, which is more durable when the camphor is introduced into the stomach than when it is injected into the veins. On account of the stimulating powers which camphor possesses over the vaso motor centre, it acts as an antagonist to chloral, and Dr. Lewin has noted when the animal has been subjected to the influence of chloral that when asphyxia was produced by arrest of respiration, there is no elevation of blood-pressure. This result is obtained by the subsequent administration of camphor. Other experiments made with bornylamine $(C_{10}H_{17}N)_2$

and amidocamphor ($C_{10}H_{19}NH_2O$) have given the following results (*Gazette Médicale de Paris*, June 17, 1890):

In the frog there is motor paresis with fibrillary contraction, but no generalized convulsions, as occurs in warm-blooded animals poisoned by means of camphor. The corneal reflex is very late in disappearing, and then there is noticed a diminution of the excitability of the peripheral nerves and a slowing of cardiac contraction, which is still later in manifesting itself in animals poisoned by amidocamphor. In the final stage of poisoning, paralysis is complete; the animal does not respond to excitation, respiration is arrested, the heart is slowed, but gradually, however, the animal slowly recovers. To obtain these results it is necessary that the dose of amidocamphor ($\frac{1}{6}$ grain) should be larger than that of bornylamine ($\frac{1}{12}$ grain).

In rabbits, the bornylamine, in the dose of 3 grains, injected subcutaneously, produces within half an hour great excitement and violent trembling, the animal cries incessantly, is soon attacked with convulsions, with oscillation, opisthotonos, and clonic contraction of the muscles of mastication. These attacks recur every five or six minutes, and may be excited by the slightest cutaneous stimulation. Symptoms of paralysis then follow, the respiration becomes dyspnœic, and the animal succumbs about half an hour after the first attack.

Amidocamphor injected into the veins of a rabbit, in the dose of 5 grains, does not produce convulsions, but simply progressive paralysis. On the other hand, in the white mouse, ¾ of a grain, injected subcutaneously, produces violent convulsions, which give place to an increasing paralysis, which finally becomes fatal.

It is thus evident that amidocamphor produces convulsive action in warm-blooded animals. Finally, the paralyzing action of bornylamine and amidocamphor, as is also the case with camphor, is exercised directly on the peripheral terminations of the motor nerves, and is thus comparable to that of curare.

This analogy of action between the two bases in question and camphor is also extended to their effects upon the heart, the circulation, and the respiration. Finally, the author states that the results obtained from this study of the pharmacological properties of bornylamine and amidocamphor are sufficient to establish the close relationship between the camphor group and the toxines.

HYDRONAPHTHOL IN THE TREATMENT OF ENTERIC FEVER AND OF DIARRHŒA.

We are now at the height of the season in which severe diarrhœa and other kindred intestinal affections are rife, and we find nearly all the medical journals teeming with various modes of treatment for these affections. We have already given many illustrations of the practice of Continental, English, and American physicians as to this class of diseases, and in the *Practitioner* for July, 1890, there is a strong paper published by Mr. K. Mitchell Clarke as to the treatment of these affections by hydronaphthol. In the treatment of intestinal catarrhs we should expect that the production of a state of antisepsis in the alimentary canal would cut short the disease, or, at any rate, mitigate the severity of the symptoms. Even during normal digestion active processes of fermentation take place in the intestinal contents, by which toxic products are formed; as a rule, these are not present in sufficient quantity to irritate the bowel, and the epithelial lining of the gut prevents their absorption into the blood. In disorders of digestion, however, these toxic fermentation products may be present in excess, may cause pain by overdistention of the bowel with gas, and set up diarrhœa by exciting excessive peristaltic action and hypersecretion. In the case of intestinal catarrh, from whatever cause it may arise, the ordinary digestive processes are interfered with, giving rise to the formation of abnormal secondary products of digestion, toxic in their nature, which irritate the intestine, and keep up or intensify the malady. In this way the duration of a catarrh, which may have arisen at first from the action for a brief period of a simple irritant, and should cease on its removal, is prolonged, and its consequences rendered more serious. In such a medium as the intestinal contents—swarming with countless bacteria—the putrefactive and fermentative processes which constantly take place will, on the smallest opportunity, proceed to excess. The fever arising in such cases of intestinal catarrh may be attributed to self-infection through the absorption into the general circulation of poisonous material from this source.

The object of producing intestinal antisepsis is to check these fermentations, by charging the medium with some body that renders their development difficult or impossible. To accomplish this end satisfactorily in the intestine, we must make use of a substance which

is both antiseptic and also practically insoluble, so that it may pass through the alimentary canal unchanged, and exerts its antiseptic action at every part of it, and at the same time be incapable of absorption into the blood, or if absorbed be harmless.

Betanaphthol has been recommended by a number of authorities in the treatment of the above conditions, and Mr. Clarke states that for some time he has been experimenting with hydronaphthol in intestinal catarrh. Hydronaphthol is prepared from betanaphthol, is less soluble in water, melts at a lower temperature, and its solution gives a deep yellow-brown instead of the green color with the tincture of chloride of iron. Betanaphthol is not poisonous, except in very large doses, but hydronaphthol is said to be absolutely innocuous; like betanaphthol, it has a faint odor of carbolic acid, and leaves a pungent or burning after-taste in the mouth, but both these characteristics are less evident than in the case of betanaphthol.

The disadvantage attending the use of both hydronaphthol and betanaphthol is that they both to a certain extent interfere with digestion, and, in fact, we can only expect that if these bodies check abnormal fermentation, they will also hinder the fermentations that constitute the chief factors in the normal digestive process; so that before again administering either hydro- or betanaphthol it was necessary to find out as far as possible whether they did hinder digestion, and if so, in what manner. To this end Mr. Clarke made the following experiments:

1. In the first, eight ounces of milk was kept at 98° in a water-bath, and the time of development of (1) lactic acid fermentation, (2) formation of curd was noted. The various quantities—two and three grains, and two and three grains repeated every two hours, while the experiment was being carried on—were added to each of four vessels respectively containing eight ounces of milk, and kept at the above temperature. It was ascertained that the time of development of acidity was not affected, but that in all the presence of hydronaphthol delayed curdling for from twelve to twenty-four hours; the delay was about the same in each, in spite of the different amounts of hydronaphthol employed.

2. Two and three grains of hydronaphthol in ten ounces of milk, to which a sufficiency of rennet had been added, did not affect the action of the rennet ferment at all, the milk being fully curdled in one hour, as in a control vessel placed beside the others.

3. One ounce of milk diluted with one ounce of water was then digested with Schacht's liquid pepsin, one drachm of which dissolves one thousand grains egg albumen; this produced partial solution of the milk, with abundant formation of peptones in from two to four hours. To a similar quantity of milk and water, placed under the same conditions, the addition of two grains of hydronaphthol made no appreciable difference; the addition of three grains to another specimen caused slight retardation; the further addition of ten minims dilute hydrochloric acid, and maintenance of the temperature, caused no further changes in the above.

4. On the pancreatic digestion of milk the presence of hydronaphthol or of betanaphthol, which was also tried, did not appear to exert any influence. Four grains of hydronaphthol were added to ten ounces of milk, and four grains betanaphthol to the same amount; pancreatic digestion was then carried out, and the results compared with those from the same quantity of milk digested with pancreatizing fluid alone. Two sets of experiments were carried out; in all the final result was the same, and the naphthol did not appear to interfere with the action of the pancreatizing fluids in any way.

5. Next five hundred grains hard-boiled white of egg were chopped up, suspended in five ounces water, and digested with fifteen minims dilute hydrochloric acid and one drachm liquid pepsin, at a temperature of 120° F.; in two hours the egg albumen was completely dissolved. To another five hundred grains placed under similar conditions four grains hydronaphthol were added, with the result that in two hours the egg albumen was not dissolved, and it was not all dissolved even after six hours.

On the same mixture of white of egg and water the effect of liq. pancreaticus was much more feeble than that of the peptic solution; with the action of liq. pancreaticus, so far as it went, hydronaphthol did not interfere.

6. Lastly, on the conversion of starch by a pancreatizing fluid, hydronaphthol had no effect.

To sum up, the above experiments show hydronaphthol to have a very distinct retarding influence on the digestion of egg albumen by peptic fluids, to have a very slight effect on the digestion of milk by the same, and to have no effect at all on pancreatic digestion of milk or albumen, nor on the conversion of starch into sugar. Milk was chosen as representing all classes of food stuffs, and as being

the staple diet in fevers and intestinal complaints, and the quantities selected were taken to represent as nearly as possible the proportions of milk and hydronaphthol likely to be present in the stomach at any one time, supposing the latter to be taken in doses of 2 or 3 grains every two or three hours.

Consequently we may conclude that to most patients on milk only, hydronaphthol may be given without fear of serious interference with digestion; that if there should be sickness while it is being administered this is probably due to retardation of peptic digestion and accumulation of undigested curd in the stomach; it would be advisable in the latter case to give the remedy in pill form coated with keratin in order that it might pass through the stomach and first be set free in the duodenum. Mr. Clarke has generally prescribed it in gelatin capsules or simply suspended in milk, but it would probably be equally efficacious given in pill form, coated with keratin. As to the dose, 2 to 3 grains every two hours is sufficient; in diarrhœa, after the first three to six doses it may be given every three or four hours, provided the effect is maintained. For children under 1 year the dose is ½ grain; to older children, ½ grain to 1 grain every hour or every two hours, or less often according to circumstances.

Five cases of typhoid fever were treated with hydronaphthol; all did well, though two of the cases were severe and prolonged. The diarrhœa was very severe on admission in the two latter, but stopped soon after hydronaphthol was given. In one case eleven stools were passed on the day of admission, ten on the next day when the remedy was first taken, and there was no further trouble from diarrhœa afterwards. In two other cases the diarrhœa was at once checked, in one after two doses had been taken, and in all it was noticed that the stools, of which the odor had previously been highly offensive, lost this. This was also noticeable in the breath. Nausea was troublesome in two of the patients, so that in one, as the diarrhœa had stopped, the hydronaphthol was discontinued; in future, by taking the precautions advised above, this complication might be prevented. It is best to begin with 3 grains, or even 4 grains, every two hours in cases of enteric fever, and when the diarrhœa is checked, to give the same dose every three hours during the whole period of pyrexia. Its beneficial effects in enteric fever led the author to give hydronaphthol in diarrhœas of various origin. Mr. Clarke thinks it will be found a valuable remedy in the diarrhœa of children, with green-colored stools so prevalent in late summer and early autumn. He has, however, had no opportunity of trying it on an extended scale, but of six cases, in which he prescribed a dose of from 1 to 2 grains every two hours, in two the diarrhœa stopped within twelve hours, in three others it had stopped entirely in thirty-six, and practically in twenty-four hours. In the other case it failed.

Mr. Clarke adds that, after administering hydronaphthol for twenty-four hours, a small dose of Dover's powder might be added with advantage, according to the patient's age. Hydronaphthol was also given with success to two patients which were the subjects of dysenteric diarrhœa, and in both relief was obtained. So also a case of tuberculous diarrhœa in a girl of 14. The diarrhœa was stopped in a week after she had taken hydronaphthol in 2-grain doses every three hours, and in two or three cases in ordinary diarrhœa, arising from errors in diet, he has found it to be an effectual remedy. In cases of flatulent dyspepsia and dilatation of the stomach, in which abnormal fermentative processes is a marked feature, and productive of much pain and discomfort, he has found that hydronaphthol has not been of much service (although one would have anticipated from the foregoing conclusions that it would give relief), perhaps because its long stay in the stomach has a prejudicial effect on the already feeble peptic power of the gastric juice.

TREATMENT OF MALIGNANT MEASLES BY MEANS OF THE COLD BATH.

Only a short time ago DIEULAFOY reported a case of malignant measles rapidly relieved, and finally cured by the use of cold baths, and at the meeting of the Société Médicale des Hôpitaux, June 12, 1890, he reports a similar case, of which the following abstract contains the most important details (*La Mède-cine Moderne*, June 26, 1890).

The case was that of a little girl, 12 years of age, in whom was noticed a slight eruption on the face, which gradually spread to the rest of the body, on the 10th of May, but as there was no fever and no malaise, no uneasiness was felt. On the next day the diagnosis of an erythema resembling measles was made, and the case was regarded as trivial, and, in fact, for the three

following days, there was no fever, and the child was apparently doing well. On the 18th of May cough occurred, on the 19th the voice became harsh and hoarse, and some disseminated sibilant râles were noted, the throat was red, and from the 20th to the 22d of May the oculo-nasal catarrh increased. Finally, on the 23d of May, a distinct eruption of measles appeared, with vomiting and a temperature of 104° F. at noon. The agitation was well marked, respiration hurried, and but little rest was obtained. On the following day Dr. Dieulafoy was called in consultation, and found an abundant eruption of measles, with excessive agitation and almost entire suppression of urine. On account of the rapid occurrence of these symptoms, a diagnosis of malignant measles was made, and since the gravity of the condition could not be attributed to any local complication, cold baths were proposed.

The first was given about noon, the patient having a temperature of about 104° F., with pulse of 145. The bath was given at a temperature of 78.8° F., being cooled gradually to 77° and 70°, cold water first being applied to the head. The patient was withdrawn in about twelve minutes, with but little change in condition apparent. Two other baths were given—one at two o'clock and another at nine o'clock—in the same evening without producing any decided results. At the last the temperature was at 104° F., and numerous râles occurring in the right lung led to the fear of a pulmonary complication and considerable hesitation as to the pursuing of this plan of treatment. However, at two o'clock in the morning a fourth bath was given, and reduced the temperature to 103° F. The child passed water, skin became softer, and pulse fell to 125, while after the fifth bath the temperature fell to 102° F., and the sleep was calm. These baths did not have any effect on the eruption. The next morning at eight o'clock the child was still asleep and the râles had disappeared. Two other baths were given on the 26th of May, the temperature falling to 102° F., and progressively declining until the patient was completely cured.

We have thus here a case of measles, rapidly assuming the malignant form, which was apparently cured by cold baths, but in which, in opposition to what was noted in Dr. Dieulafoy's first case, the improvement did not appear until after the fourth bath. One of the most striking facts in this case is that, as a consequence of the cold baths, the suppressed function of the kidneys was resumed, and as it is well known that suppression of urine is one of the dangers most to be dreaded in virulent diseases, the production of diuresis by cold baths is certainly a very strong argument in their favor.

Again, it would appear that the case reported by Dieulafoy showed signs of approaching bronchitis, and yet on the very next day after the application of the bath the râles had almost entirely disappeared. Of course, it is not certain the cold baths relieved the pulmonary function, but it is certainly well known that in typhoid fever pulmonary complications are no obstacle to the administration of cold baths, and even in infectious forms of pneumonia they are employed with benefit. Further, in Dr. Dieulafoy's first case, the cold baths were not employed until after the eruption had terminated, but here they were administered even while the skin was covered with a profuse eruption. After each bath it was noticed, however, to regain its intensity a quarter of an hour afterwards, the eruption or desquamation not being influenced by the bath. Dr. Dieulafoy, therefore, claims that in the ataxo-adynamic form of disease, no matter when they may occur, benefit may be expected from cold baths without fear of any complications, provided they be given regularly and with perseverance.

In the discussion which followed the reading of this paper, Dr. Renoy stated that he had treated several cases of pneumonia with cold baths with success, and as regards the influence of the cold baths on eruptions and pulmonary complications, he had recently had under his care a child of nine months of age suffering with measles and double bronchopneumonia; the measles which had not at first come out were rapidly developed by the baths, and cure was produced. Dr. Renoy believes that if Dr. Dieulafoy had employed a *cold* bath and not a *cool* bath at 78° F. he would have noted more rapid amelioration in his patient's condition.

Dr. Fereol also stated that he had previously hesitated before the dangers of pulmonary congestion, which might be expected to attend the employment of cold baths, but now he was convinced that, on the contrary, they even exerted a favorable influence on this condition, and that, moreover, he believes that in pneumonia the permanent application of cold compresses, renewed every hour, is an admirable measure.

In concluding, DR. DIEULAFOY called attention to the fact that it was very difficult to state exactly where the lukewarm bath commenced and the cold bath finished. It is very certain that a bath of 89° F. is cold for a patient who has a temperature of 104° F., while, on the other hand, a bath of 78° F., or even as low as 70° F., will naturally be expected to produce more rapid effects than one of a higher temperature, and he believes with Dr. Renoy that if he had been allowed to employ a colder bath, improvement would have been more rapidly attained. He adds that, while the warm or lukewarm bath is calming, the cold bath is really curative, and advises the cold bath in virulent affections.

PHYSIOLOGICAL ACTION OF THE ACTIVE PRINCIPLES OF JEQUIRITY.

Klein has shown that the poisonous properties of the seeds of *Abrus precatorius* (jequirity) cannot be due to a bacillus, and Warden and Waddell ("Non-Bacillar Nature of Abrus Poison," Calcutta, 1884) showed it to be due to the action of a poisonous proteid. The proteids in the seeds are two in number,—a globulin and an albumose,—and the present paper, by S. MARTIN and R. N. WOLFENDEN (*American Journal of Pharmacy*, July, 1890), relates to the physiological action of the first of these. The proteids were obtained by extracting the crushed seeds with fifteen per cent. solution of sodium chloride; they were precipitated from this extract by saturation with ammonium sulphate; the precipitate was redissolved by adding water; and from this solution the globulin was precipitated by dialysis, collected, washed, and dried.

The actions ascribable to this globulin are the production of local œdema and inflammation when subcutaneously injected or applied to the eye, the presence post mortem of petechiæ beneath the serous membranes, and the occurrence of hemorrhagic gastro-enteritis. It also produces a remarkable fall of body temperature after subcutaneous injection, and in lethal doses it causes rapidity of breathing shortly before death. It has little or no effect on blood-pressure. The activity of this globulin is destroyed by heating the solution to 75° or 80°, the temperature at which it enters into the condition of a heat coagulum.

In a second paper (*ibid.*, pp. 100-108) S. Martin describes the toxic action of the *albumose*, which was obtained by precipitating the proteids of the seeds by means of alcohol. The precipitate was allowed to remain under absolute alcohol for several months; the globulin was thus rendered insoluble; the albumose, however, was freely soluble in water after this treatment. It gave the following reactions: The aqueous solution was neutral to litmus-paper, and gave no precipitate on boiling. Acetic acid and also nitric acid gave precipitates which dissolved on heating and reappeared on cooling. Copper sulphate gave a precipitate soluble in excess of the reagent. Copper sulphate and potash gave a "biuret" reaction. Mercuric chloride gave a precipitate insoluble in excess of the reagent. The symptoms produced by the albumose closely resemble those noticed when the globulin is hypodermically injected. There is gradually increasing weakness, with rapid breathing and lowering of body temperature, but no convulsions or paralysis. It also causes severe conjunctivitis when applied to the eye. Its poisonous properties are lessened by heating at 70° to 75°, and completely destroyed at 85°.

The albumose is not, however, so powerful a toxic agent as the globulin, the dose necessary to produce the same effects being larger.

A comparison is drawn between the action of the proteids and those of other poisonous substances of the same class, especially those in snake-venom.

The following table contrasts the activity of the venom of various snakes and of abrus:

Common Adder.—Fatal dose in man, .0021 gramme per kilogramme of body-weight (Fontana).

Australian Tiger-Snake.—Fatal dose in dog, .00485 gramme per kilogramme of body-weight.

Cobra.—Fatal dose in dog, .000079 gramme per kilogramme of body-weight (Vincent Richards).

Globulin.—Fatal dose, .01 gramme per kilogramme of body-weight.

Albumose.—Fatal dose, .06 gramme per kilogramme of body-weight.

Peptic Albumoses.—Fatal dose in dog, any dose over .3 gramme per kilogramme of body-weight (Pollitzer).

ACTION OF ARISTOL IN ULCERATIONS OF THE SKIN.

It is well known that for some time in Germany experiments have been under way with a substance called aristol, which is a combi-

nation of iodine and thymol, and appears in the form of a reddish-yellow powder without the least odor.

In his letter to the *Journal of Cutaneous and Genito-Urinary Diseases* for July, 1890, DR. BROCQ writes that he has recently been trying this substance in his hospital service, and that it appears to possess valuable properties dusted over ulcerated surfaces, and he believes it is destined to replace iodoform with advantage in many cases.

He reports that he has obtained satisfactory results in a case of chancroid as large as a silver ten-cent piece, with undermined edges and perpendicular border, its nature having been verified by experimental auto-inoculation. In four or five days the ulceration was completely modified in aspect and had lost its virulence. He regrets very much that the rarity of chancroids in Paris has not permitted him to multiply this experience, as a single case does not prove much. In tertiary syphilitic ulcerations he states that it appears to increase the cicatrization. Thus, a deep ulcerating gumma of the neck has been completely cured in the space of eight days under the influence of dressings of powdered aristol, and mixed treatment, which consisted in daily frictions with blue ointment, and the administration of four and then of six grammes of the iodide of potassium per day.

Dr. Brocq has used aristol in two cases of epithelioma of the skin deeply ulcerated, the one in a woman of 50, who had already been treated by scraping and by applications of powdered chlorate of potassium. An elongated ulceration with calloused margins had persisted, which, under aristol, cicatrized in fifteen days. The other case is that of a patient the entire upper part of whose cheek and lower lid are eaten out by an epithelioma declared inoperable by the surgeons. Twelve days of application of aristol in powder has much decreased the ulceration, and he is still continuing the treatment. He wishes it to be carefully noted that he does not speak of the curative virtue of aristol in epithelioma, in the same way that he has not spoken of its curative virtue in syphilitic ulcerations, and as he will presently speak of its curative powers in dealing with tuberculous ulcerations.

The author says (and insists upon this point so that he will not be made to say what he does not wish to say) that aristol has in these ulcerations incontestable cicatrizing properties, which have appeared to him even remarkable. Always in the same order of ideas the powder of aristol can be considered as an excellent topical application for ulcers of the leg. Dr. Brocq has tried it in four cases of deep varicose ulcers. In two of these cases, as there were present two large and distinct ulcers upon the leg, he dressed one with powdered iodoform or with powdered subcarbonate of iron, while he treated the other and larger one with powdered aristol. Although these experiments have been restricted, he thinks he can conclude that aristol, combined with absolute repose of the leg, gives, in ordinary cases of varicose ulcer, a rather rapid cicatrix,—that is to say, in about twenty-five to thirty days for an ulceration four to five centimetres wide, by six to seven long, and four to five millimetres deep. In a word, if the patient's general condition be good and the ulceration be not surrounded by dense callous cicatricial tissue of low vitality, the cicatrization advances at the rate of about a centimetre per week under the influence of aristol. The cicatrizing properties are thus seen to be altogether comparable to those of powdered iodoform and to those of subcarbonate of iron. Dr. Brocq believes that in one of his patients they were superior; in another, on the contrary, they seemed less powerful. It is probable that this cicatrizing action is more marked during the first few days of the application and then diminishes, and he therefore thinks there will be a certain advantage in employing successively the aristol, subcarbonate of iron, and iodoform in rebellious ulcerations. Aristol is less irritating than iodoform, and it is thus that in one of his patients, in whom he dressed one ulcer with aristol and the other with iodoform, he was obliged, at the end of six days of treatment, to suspend applications of iodoform, because the skin about the ulcer had become red, tumefied, and eczematous, while around the ulcer which was dressed with aristol the skin was normal. Aristol has also more marked irritating properties than subcarbonate of iron. In the same patient he dressed the ulcer which had been inflamed with iodoform with subcarbonate of iron. At the end of a few days it took on a healthy aspect and tended to cicatrize without the least surrounding inflammatory reaction. About the fifteenth day of treatment, on the contrary, there was produced all about the wound dressed with aristol a slight redness and a little discharge. The aristol gave no result in one case of ulcer of the leg situated in the midst of callous fri-

able tissue, without the least vitality. It is true, however, that no other treatment had succeeded. One of the affections against which aristol seems to have the most power is local tuberculosis of the ulcerating variety. He has treated for a long time an ulcerating lupus of the elephantine variety upon the foot, using cauterizations with lactic acid, dressings with camphorated naphthol and iodoform.

In fifteen days after aristol was first used, cicatrization of the ulcerations took place. Another tuberculous ulceration, developed on a scrofulo-tuberculous ulceration, closed under this dressing in twelve days. On the other hand, salves of aristol have not yet appeared to give marked curative effects in cases of superficial non-ulcerating lupus, and in cases of lupus erythematosus. Experiments in this respect are still being carried out by the writer.

Dr. Brocq, in conclusion, says, "In a word, without wishing to unduly praise the therapeutic properties of a substance which I have just begun to employ, and reserving the privilege of modifying these opinions after a more extended trial, I believe that aristol may render very real service in ulcerations of the skin. It has no odor, and in this respect seems to me superior to iodoform; on the other hand, it does not soil as much as the subcarbonate of iron."

INDICATIONS FOR THE USE OF GLYCERIN INJECTIONS AND SUPPOSITORIES.

The observation of the effects of glycerin injections and suppositories in a large number of patients has led Dr. Polubinski (*Deutsche Medizinal-Zeitung*, June 19, 1890) to the following conclusions:

There is no doubt that glycerin irritates the mucous membrane of the rectum. This is shown both subjectively in the burning produced by it, and objectively by the ascending of the mercurial column of the thermometer, if pushed deep enough within the intestine.

The increase of temperature and the desire to defecate are of but short duration, and the latter may often be overcome voluntarily by the patient. The irritation of the mucous membrane produces no local secretion, since the fæces, evacuated as a consequence of injections of glycerin, are only covered with glycerin. The author obtained the best results when the rectum and sigmoid flexure are filled with scybala. If fæces collect in the upper parts of the intestinal tract, glycerin is then inefficacious. According to the author, therefore, the cases in which glycerin enemata and suppositories are indicated are,—*first*, when the fæcal masses are already in the rectum; *second*, when they are in the parts of the large intestine immediately above, as occurs so often in lying-in women; *third*, in diseases or physiological conditions which produce mechanical pressure on the rectum or sigmoid flexure, such, for example, as new formations in the pelvis, pregnancy, etc.; *fourth*, in scrofulous children; *fifth*, in persons who, although they may daily succeed in having evacuations of the bowels, yet in whom the act of defecation is only accomplished with difficulty and accompanied by pain, and in whom in general the fæces are of excessive density.

THE ACTION OF HOT AND DRY AIR ON THE TEMPERATURE OF THE LUNG.

Some experiments made by Dr. Sehrwald as to the influence of inhalations of warm and of dry air on the temperature of the lung have led him to the following conclusions (*Bulletin Général de Thérapeutique*, July 3, 1890):

Dry air at a temperature of 662° F. (?), inspired by the nose, only raised the temperature of the lungs about 1½°, even though the inhalation was practised without interruption for an hour and a half.

2. An equal increase of temperature may be produced by the simple inhalation of ordinary atmospheric air at the ordinary temperature, provided respiration be more vigorously performed.

3. In the inhalation of hot air by the nose, respiration is accelerated, and becomes very vigorous, so that, therefore, elevation of the temperature of the lung may be attributed to this increased functional activity of the lungs.

4. The mucous membrane of the trachea is much more sensitive to hot air and dry air than that of the mouth and nose.

5. When the air is allowed to penetrate directly into the trachea tolerance ceases when the temperature of the dry hot air rises above 176° F.

6. As a consequence of the direct penetration into the trachea of air of 176° F., respiration becomes accelerated to 144 in a minute or more.

7. During this time the temperature of the

lung does not rise more than a little above 1° F.

8. The opinion of Halter, that the bacilli of tuberculosis are destroyed after subjection for short intervals to air at a temperature of 105°, has never been demonstrated. The above is confirmatory of a large number of other testimony which we have published on the same subject, and together should do away with the employment of hot air in the treatment of tuberculosis.

THE ACTION OF SUGARS ON THE ORGANISM.

We have on a number of occasions called attention to various papers which have been published as to the diuretic action of sugar, and an article by DR. ALBERTONI, discussed by Dr. Louise G. Rabimovitch in the *New York Medical Journal*, July 5, 1890, is, therefore, a timely one. Dr. Albertoni considers the question of the absorption of sugars which are injected in considerable quantities as food to be important; it concerns, he thinks, both physiology and pathology, as far as it relates to the pathogenesis of diabetes.

With reference to the absorption of glucose, the works of Funke, Von Becker, R. Meade Smith, Anrep, and Tappeiner are mentioned, with the objection, however, that the animals experimented upon by these authors were under special or artificial conditions, and that in general their works show only that glucose is absorbed in the gastro-intestinal tract, without specifying the quantity and limits of absorption, especially in the normal state of the system.

On the ground of his experiments, M. Albertoni thinks it is incorrect to admit that the absorption is regulated by the physical laws of density of liquids. The object of his work is to determine the rapidity and intensity of absorption of glucose solutions of different degrees of concentration introduced into the gastro-intestinal tract under normal conditions.

The author experimented on dogs which were deprived of food for twenty-four hours. The amount of sugar in the solution ingested or injected, and the time that it remained in the gastro-intestinal tract, having been known, he was enabled to judge of the amount of sugars absorbed for a given time by collecting the remaining liquids in the same tract after sacrificing the animal and testing the liquid, previously purified, by means of different chemical methods.

An elaborate table of experiments is given, and the author concludes that the rapidity and intensity of the absorption of glucose are considerably greater than they have been supposed to be. According to the table, the absorption of glucose in an hour amounts to from sixty to sixty-five grammes, and during the subsequent hours the quantity absorbed diminishes; the explanation of this is, as alleged, that, the organism being saturated with glucose to a given point, its absorbing property for the glucose diminishes.

The statement as regards absorption is true of glucose solutions of less as well as of greater density than that of the blood, the fact being more conspicuous, however, in the former case. The sugar solution remaining in the stomach unabsorbed diminishes always in density, which may become inferior to that of the blood, but is superior to that of the plasma.

The glucose disappears from the stomach independently of the quantity of water in which it is dissolved, and disappears in greater quantity than the water that holds it in solution, without respect to whether the solution is of less or greater density than the water.

It is probable, Professor Albertoni thinks, that the absorption is accomplished in the stomach itself; it always contains the unabsorbed mass of liquid. He seeks confirmation of the statement in one of the experiments in which the vagi were cut through; because of the induced pyloric insufficiency, the intestine contained much more liquid and glucose than in any other experiment.

The effect of sugars on the circulation is under consideration in the second part of the work, and this is stated to be the first work on the subject.

a. Action on the Blood-Pressure.—The author published his first work concerning the question some years ago, in which he endeavored to show that saccharose and glucose injected into the blood in moderate doses augmented the blood-pressure, and that this was manifested instantly, lasting as long as the blood contained an excess of sugar. The degree of augmentation of blood-pressure is not in relation with the quantity injected, but its duration is, for the organism needs a longer time to eliminate the excess of sugar.

It is known now, the author alleges, that maltose is formed at the same time with the

glucose, and, having used pure maltose in his experiments, he found this substance to act like glucose and saccharose.

The results of the experiments are given in a table which shows the decided augmentation of blood-pressure, the mechanism of which is explained as follows:

1. The augmentation of blood-pressure is brought about neither by the influence of the vaso-motor centres nor by the action on the capillaries themselves; the vessels dilate relatively after injection of glucose, and the blood-pressure augments whether a section is made of the cord beneath the calamus or of the cord and the vagi.

2. The augmentation of pressure is not dependent upon paralysis of the vagi, since it remains the same after section of these nerves, and, in case of the pressure being augmented by glucose injections, the pressure increases progressively after the section of the nerves.

The heart is the organ that shares in this augmentation of blood-pressure; the increased frequency of the heart-beats is not the essential factor necessary to accomplish this, for in dogs whose vagi are cut the pressure increases after injection of glucose without the pulse becoming more frequent. It is the increased systolic excursion that maintains the elevation of pressure. This fact was evident from experiments on frogs whose heart-beats were obtained by Marey's apparatus. A few drops of a one per cent. glucose solution were poured on the cardiac muscle, and the elevation of blood-pressure was most conspicuous. The reasoning does not hold good if the increased pressure is explained by the presence of an additional amount of liquid in the shape of the solution in the blood; for, firstly, the added mass, from four to eight grammes, which suffices to augment considerably the pressure, is too small to be looked upon as a cause of augmentation; secondly, the coexisting vascular dilatation would compensate sufficiently for the additional liquid mass.

The supposition that the phenomenon might be due to the fever induced by the injection into the blood is to be excluded with certainty, for the effects are instantaneous and last as long as there is an excess of sugar in the blood.

b. The Action on the Frequency of the Pulse.—This augments with the blood-pressure, the ratio being 20 to 40 pulsations a minute, according to what animal is used after an injection of from 15 to 30 grammes of glucose, maltose, or saccharose. It lasts until the excess of sugar is eliminated from the blood. This augmentation in the frequency of the pulse is not met with in either rabbits or dogs whose cervical vagi are cut.

The author experimented on human subjects, administering sugar by the mouth; he concludes that a slight augmentation in the frequency of the pulse is noticed, which is manifested more or less quickly, according to different accidental and secondary circumstances. In cases where there was nausea, the pulse failed to become more frequent.

The foods, the author concludes, containing starches and sugar have certainly an analogous action on the organism, and this explains certain physiological phenomena subsequent to meals.

c. Action on the Blood-Vessels and the Velocity of the Circulation.—The action of glucose on the vessels is determined by observing the change in volume of the organs, and the quantity of blood flowing out from an opened vessel in a unit of time.

That sugar dilates the blood-vessels was inferred from the augmentation of the limbs in volume; this was verified by means of Roy's apparatus, and the quantity of blood shed from a given vessel in a unit of time was double the normal. The rapidity of the circulation was decidedly increased.

d. The Influence of Sugars on the Urinary Secretion.—A number of authors, it is said, are of the opinion that in diabetes the extraordinary increase of the amount of urine is dependent upon the elimination of sugar; special researches on the subject have been made only recently by Richet, Moutard-Martin, and the author himself. According to Richet and Moutard-Martin, a small amount of sugar in the blood—.50 gramme to the animal's kilogramme of weight—is sufficient to induce a noticeable polyuria. It is not to be attributed to the water absorbed with the solution, for ten times the volume of pure water injected will not produce the same effect.

The author professes to have investigated the question before the authors named (*Giornal. di Quest. Acc.*, v. v., xxix. p. 178), and to have endeavored to point out that the duration and intensity of the induced polyuria varied according to the quantity of sugar injected. The polyuria and glycosuria are not dependent upon spinal irritation, which might give similar results; the same phenomena are observed in dogs with the spinal cord divided below the calamus.

Neither is the fact to be attributed to the increased blood-pressure, for the same is the case in rabbits, which present no modification of blood-pressure.

The dilatation of the renal vessels and the increased rapidity of the circulation determined by the glucose are said to account partly for the polyuria. Besides the indications of these facts by the angeiometer, there is some special effect of the sugar on the uriniferous tubules.

Munk is quoted as having shown on an isolated kidney that the addition of a half per cent. of sugar to the blood led to the production of eight times the normal amount of urine.

Maltose is assimilated in the same proportion as glucose; this is in accordance with the results of Dastre and Bourquelot.

Morphine and chloral interfere with the effects of sugar on the circulation, and have but little influence on the polyuria and glycosuria. Since these drugs are used in diabetes, their effect was tested by administering them before injecting the sugar in small doses. They seemed to check the polyuria and glycosuria to some degree, but this was not the case when large doses of sugar were given.

The experiments show that sugars are not only foods, but at the same time agents modifying the functional actions of the organism. Sugars entering the blood after meals affect the circulation in a way opposite to the enfeebling action of some albuminoid derivatives of peptones that can be formed in the process of digestion (the peptin of Albertoni, the peptonin of Brieger).

Cohnheim is quoted as saying that the accumulation of sugar in the blood is the centre of all the phenomena of diabetes, and it is presumed that the same phenomena may be induced artificially by injecting sugar into the blood. The quantitative modifications of the urinary secretion and the changes in the circulatory apparatus are equally produced and are transitory in diabetic patients.

It remains to decide, the author remarks, what the reasons are for the accumulation of glucose in the blood of diabetic patients.

TREATMENT OF BUBO.

According to Dr. Cordier, of Lyon, the procedure which has given him the best results in the treatment of bubo is as follows: As soon as the œdema of the skin shows the presence of pus, he makes a puncture with a straight bistoury. There is discharged along with the blood some streaks of pus. No pressure is made, but the cavity is injected with about a cubic centimetre of a 1 to 50 solution of nitrate of silver. Without paying any attention to whether the solution flows out again or not, a dressing is made with iodoform and a spica bandage. When this slight operation is made early enough, no purulent discharge follows, and the bubo disappears rapidly in leaving behind a sort of indurated nodule. When the puncture is done in a bubo much more advanced and in full suppuration, the purulent collection must be carefully washed out. A first injection of the solution mentioned is made, which is destined to cleanse the parts, and the second injection is left in; a decided inflammatory reaction is established, and quite an abundant suppuration occurs, and lasts for three or four days, and then becomes serous. Healing takes place rapidly, and the opening closes without leaving a cicatrix. Dr. Cordier has had the same results, whether the bubo was chancrous or simply inflammatory. *Journal of Cutaneous and Genito-Urinary Diseases*, July, 1890.

THE TREATMENT OF PNEUMONIA BY COLD BATHS.

The treatment of pneumonia by cold baths is by no means a novel idea, since we can find records of this mode of treatment in the seventeenth and eighteenth centuries. Nevertheless, this treatment of pneumonia has not been adopted with any degree of uniformity, although the works of Wunderlich and the application of Brand's method show that the abstraction of heat from the body by cold water may be of great service in a large number of diseases. In France and in this country cold baths have been almost restricted to the treatment of infectious fevers. In pneumonia it is natural that early attempts at the employment of this mode of treatment should have been attended with a good deal of hesitation, and in 1880 Hanot published a monograph, in which he claimed that it was both useless and dangerous; today, however, we are beginning to appreciate the value of the employment of cold baths in febrile and pulmonary affections, and at the meeting of the Société des Hôpitaux, held June 25, 1890 (*La Médecine Moderne*, July 3, 1890), Dr. Barth stated that

two years ago he had under his care a young woman, 33 years of age, attacked with pneumonia of the right apex, with symptoms of cardiac asthenia, and in whom the temperature rose in forty-eight hours to 106.5° F. In the face of this hyperpyrexia, Dr. Barth had recourse to cold baths, and he states that the effect was marvellous. Encouraged by this result, he writes that he has not hesitated to employ this method of treatment in all cases of pneumonia or hyperpyrexia; but naturally this mode of treatment is not indicated in cachectic individuals, in benign cases, or where organic lesions are present which would counter-indicate their employment. In these cases he states that he feels confident that he has saved life by the employment of cold baths.

In pneumonia the initial intra-pulmonary fluxion favors the reproduction of the micro-organisms, and the exudation soon becomes an obstacle to respiration, and thus interferes with oxidation of the blood, but during this time the organism is consumed by an intense fever, which demands an increased aëration of the blood, for the blood becomes charged with products of disorganizations which cannot be eliminated, and in time the whole is infected by micro-organisms, which may produce local results of a most serious character. The effect of cold baths is not only due to the subtraction of heat, for the momentary refrigeration is really itself but a single and by no means the most valuable result. Cold at first contracts the peripheral blood-vessels, augments blood tension, and, as a consequence, the work of the heart is increased, then reaction calls the blood to the periphery, and there is at the same time energetic stimulation of the nervous system in all its parts; while, finally, and most important of all, the secretions, and especially the renal secretions, are augmented; the importance of this in infectious diseases cannot be overestimated. Through this follows stimulation of the heart and nervous system and augmentation of secretion.

These actions are favorable, provided the organism be brought into a condition to react, but if the heart is altered in its substance, syncope may occur. If the peripheral blood-vessels are diseased, rupture may take place if the nervous system is profoundly affected, and fatal collapse may occur.

It is thus necessary to determine before giving cold baths whether the organs of the body are in a condition to support their action. Further, the temperature of the bath must be adapted to the age and the state of the patient, and Dr. Barth maintains that it is advisable to commence with lukewarm baths, and then gradually decrease the temperature of the water until it reaches 64°, while stimulating injections of caffeine and the administration of spirits should be resorted to.

ETHER AS A MENSTRUUM IN MEDICATION BY THE SKIN.

Authorities have been divided as to how far, if at all, the local and remote effects of remedies applied to the human body in morbid states can be produced through the cutaneous surface. No practitioner of medicine is likely to doubt, however, that the human body, in many of its organs and tissues, can be readily brought under the direct and distant influences of mercury by the cutaneous inunction of mercurial ointment. It is easy to question the efficacy of remedies exhibited by the skin when the effects which they produce are less objective in their demonstration than those of mercury. We may recall that the capacity of the skin to absorb medicinal substances from their aqueous solution in baths was accepted in the medicine of the ancients, whose therapeutic uses of medicated baths we are now learning, *longo intervallo*, to imitate. The question has been discussed frequently since the close of the last century. At that time Abernethy and Falkner concluded, from a series of experiments, that the absorption of some remedies through the skin did take place under certain conditions; and, while some other observers were led to qualify or to contradict these inductions, affirmative conclusions upon the subject were fully supported by Braconnot, Chevallier and Petit, and other investigators. Some striking instances of efficient percutaneous medication are well known to us. For example, ointment of aconitine rubbed upon the skin of the face produces anæsthesia of the subjacent sensory nerves, "so that a razor passed over the part in the act of shaving is not felt." We are accustomed in medical practice to present remedies to the skin with the view of producing remote as well as local effects, in the various forms of the officinal emplastra, of the officinal liniments (alcohol, oleaginous, and saponaceous), and of fatty unguents. Of these separate forms of medicaments in enepidermic use, the ointments and the oily liniments are probably the most active, because of their

easy admixture with the fatty sebaceous secretion of the skin. A "true plaster" is held to have for its basis litharge in union with oleic, margaric, and stearic acids, and eleven officinal plasters are so composed. The other plasters, which are not strictly plasters, take their body from the chemical action of their ingredients, as in emplastrum ammoniaci cum hydrargyrum, or from wax, lard, pitch, frankincense, suet, resin, soap, and some fixed oils, in various combinations. Neither a plaster so formed nor a solution in alcohol of the active principles of drugs is a scientific medicament for enepidermic employment and percutaneous action, if we have regard to the structure and physiology of the human skin.

It will be found, however, that there are in practice three separate obstacles to the absorption of a medicine through the skin,—namely, the epidermis, the sebaceous secretion of the skin, and the relative insolubility of the drug which is employed in any particular case. After a number of experiments it occurred to Sir James Sawyer (*Lancet*, July 12, 1890) that ether would be the best menstruum at our disposal for the solution of many remedies designed for enepidermic application, and he concluded that ethereal liniments would be more active through the skin, and certainly stand upon a better scientific basis than plasters, than any of the officinal liniments, or even than fatty unguents. Ether presents several advantages over other bases and menstrua for remedies applied to the skin. It has great endosmotic capacity; it probably possesses in a high degree what has been called "diffusion power;" it is a solvent of high potency for many active drugs, or, more precisely, for the active principles of many such drugs; and it also is a ready solvent of the fatty constituents of the sebaceous secretion of the skin. When we use ether as a dissolvent for an active drug which we apply to the skin, we apply our remedy in solution in a menstruum which is a perfect solvent for the obstructing fatty sebaceous secretion of the cutaneous surface; we employ a menstruum which, by its solution of the fatty secretion, permits the most intimate application of the remedy to the bare epidermal surface.

In the early part of this year Sir James Sawyer published a brief account of an ethereal tincture of capsicum, which he has been using largely in practice, and which he has found to be a very active rubefacient and an efficient remedy in several painful maladies. He now recommends ether as a solvent vehicle for some other remedies which may be applied to the skin. After examining a large number of drugs, he has selected iodine, belladonna, and menthol, besides capsicum, as suitable for external therapeutic employment in the form of ethereal tinctures. It appears that the ethereal tincture of belladonna should be made from belladonna-root, with camphor, of the same strength as the belladonna liniment of the Pharmacopœia, using the officinal pure ether in its preparation instead of rectified spirit of wine. The result is a bright tincture of a brilliant "apple-green" color. The author thinks this tincture will be found useful as a paint for the skin in cardiac and other cases in which belladonna plasters or liniments would otherwise be employed. He uses belladonna-root instead of belladonna-leaves because it gives a preparation which does not color the surface of the skin as one made from the leaves does. The author prefers the tincture of iodine to be of the same strength as the officinal tincture of iodine. To form an ethereal tincture of menthol he has fixed upon a solution of menthol in pure ether, of the strength of one drachm of menthol in a fluidounce of the solution. For the application of ethereal tincture of menthol he has found it best to use a brush of glass. When the meshes of the brush become clogged with menthol, by the evaporation of the ether of the preparation, they can be freed in a moment by dipping the brush into the tincture. The writer claims that this preparation can be readily applied as a paint to the skin, and that it is an efficient means of using menthol for its local therapeutic effects, especially for the removal of superficial neuralgic pains. It should be lightly painted over the painful part. The quick evaporation of the ether gives a grateful sense of coolness, which supplements the analgesic action of the menthol, and allows the easy application of a succession of coats, which leave pure menthol in a finely-divided condition upon the skin.

LACTIC ACID IN THE TREATMENT OF DIARRHŒA.

We have already referred to the recommendation of Dr. Hayem as to the utility of lactic acid in the treatment of the green diarrhœa of children and of the different forms of diarrhœa in adults, and at the Société Médicale des Hôpitaux, held June 25, 1890 (*La Méd. Moderne*, July 3, 1890), he stated that he had continued testing the value of this remedy in

these affections, and up to the present time he had always met with success in its employment in the diarrhœa of adults. It is strange that, in view of the remarkable success which it appears to have obtained, lactic acid is scarcely mentioned for this purpose in the most recent works on therapeutics, although it has acquired considerable repute in the local treatment of tuberculous lesions.

This acid belongs to the fatty series, is formed in the stomach and intestinal canal, although when hydrochloric acid is present in large amount it almost entirely disappears. There seems to be little doubt that lactic acid may be concerned in gastric digestion, and has some value as a remedy in dyspepsia and as a preventive of fermentation, although to a less degree than hydrochloric acid. Lactic acid is absorbed in the stomach in the form of lactates, which become changed in the blood, forming alkaline carbonates, which are then excreted by the kidneys, and give an alkaline reaction to the urine. If, however, it is given in large amounts (50 grains or more), it passes through the kidneys unchanged. It would thus seem probable that in employing sufficiently large doses it could arrive unchanged in the intestine, and there exercise direct effects, whether of a germicidal nature or of a topical character.

It has been claimed that lactic acid in large doses removes alkalies from the organism, and thus produces various disturbances, such as vomiting, diarrhœa, and loss of flesh. Hayem, indeed, believes that osteomalacia and rachitis are due to the decalcification of the blood by lactic acid; but Heiss has been able to administer immense amounts to a dog without producing any disturbance during life or any discoverable lesion post mortem. Dr. Hayem prescribes lactic acid, in the dose of 150 to 200 grains, in the form of a lemonade sweetened with syrup and dissolved in large quantities of water. In a certain number of cases Dr. Hayem restricted all alimentation to kéfir, and he states that in the last two years he has been administering this, together with lactic acid, to his phthisical patients affected with dyspeptic troubles, and he has found their diarrhœa is by these measures readily suppressed. Lactic acid seems to succeed less well in entero-colitis than in other intestinal affections, a fact which proves that it only reaches the large intestine in a diluted condition. The author has found, however, that it is especially successful in the diarrhœa of typhoid fever. In many cases of chronic diarrhœa an examination of the gastric contents will discover that the diarrhœa is caused by defects in the gastric digestion largely attributable to a deficiency of acid. Here especially lactic acid may be expected to succeed. Also in cholera morbus and epidemic cholera, Dr. Hayem states that this remedy is an effective one; for the latter purpose he recommends the administration of 115 to 160 grains daily, while, as a means of treatment, he states that he would not hesitate to administer 120 to 300 grains in twenty four hours.

RESEARCHES ON A NEW METHOD OF ASCERTAINING THE DIGESTIVE POWER OF THE GASTRIC JUICE WITHOUT USING THE SOUND.

Marfan has investigated a number of cases with a view to testing the reliability of Günzburg's procedure (*Medical Chronicle*, July, 1890). This consists in administering three or four grains of iodide of potassium enclosed in a fragment of thin india-rubber tubing, the ends of which are fastened down and tied with three threads of fibrin which has been made flexible by preservation in alcohol. The threads are carefully and equally tied. The packets thus made up are preserved in glycerin, and when about to be used are dried with filter-paper or absolute alcohol and put in a gelatin capsule. A test-meal, such as that recommended by Ewald, consisting of a roll of white bread and about ten ounces of water, is given, and, after the lapse of an hour, the capsule is swallowed. The author employed a test-meal consisting of an egg, about three ounces of bread, and a glass of water. If the digestive power of the juice be normal, the threads of fibrin are quickly dissolved, the iodide of potassium is set free in the stomach, absorbed under normal conditions, and tested for at intervals of five minutes to a quarter of an hour in the saliva or urine. The iodide is detected by adding to the saliva a few drops of a solution of starch and fuming nitric acid. The iodine is liberated by the acid, and gives at first a red and afterwards a blue color with the starch solution. For practical purposes Marfan has found it only necessary to test the saliva every quarter of an hour. The patient spits into suitable vessels, which are labelled with the time, and can be tested at the daily visit.

The capsule is taken into the stomach at a time when the HCl ought to be abundant.

The gelatin is dissolved in all cases, whatever the state of the secretion, nearly in the same time, but the solution of the fibrin of course depends on the activity of the gastric juice. Normally it takes an hour. When it is complete the iodide is set free, dissolved, absorbed, and eliminated by the saliva in the healthy subject in a quarter of an hour more, and at the end of that time can be detected in the manner stated. In hyperacidity Günzburg found the reaction in three-quarters of an hour, in patients having a normal acidity in an hour and a quarter, in those with lessened acidity in from an hour and three-quarters to as late as four and five hours after ingestion. Marfan, after testing a number of cases by the usual methods and then using the capsules, obtained the following results: Where three per mille of HCl or more was present, the reaction was obtained in three-quarters of an hour; with 2.5 per mille, in one hour; two per mille, an hour and a quarter; 1.5, an hour and three-quarters; with less than one per mille, two hours and more. In this way sixty cases were tested, among them being eighteen cases of phthisis. The results obtained in this disease were one slight increase of HCl, two normal, fifteen insufficiency. The remaining cases present nothing worthy of remark.

THERAPEUTIC EFFECTS OF HEAT ON SYPHILIS.

Dr. K. A. P. Y. Kalashnikoff has made a series of observations on the therapeutic effects of heat on syphilis, and especially on syphilitic eruptions, his patients being inmates of a St. Petersburg lock hospital for women and children. The heat was applied where possible by means of partial hot air baths administered to the affected part for half an hour twice a day, the part being enveloped in hot flannel immediately afterwards, and remaining so protected until the next hot-air bath. The temperature never exceeded 116° F. Where the eruption was on the back or neck, or on some part which it was impossible to insert in a hot-air chamber, india-rubber hot-water bottles, or tubes through which hot water was kept flowing, were employed. When both arms or legs were affected in a symmetrical manner the treatment was confined to one side, the other being left untreated for the purpose of comparison. The results showed that, generally speaking, the heat treatment acted very energetically and beneficially on syphilides, both when employed alone, instead of mercurials and iodides, and also when used in conjunction with these remedies. Often heat proved beneficial when the ordinary specifics had failed. Among other observations it was noted that hard chancres healed and the induration disappeared in from eight to sixteen days; roseola and papular erythema disappeared in from four to eight days; various forms of papular and impetiginous syphilides, with marked pigmentation, disappeared in from eight to twenty-one days; non-ulcerated tubercles and gummata disappeared in from seven to twenty-four days, but those which had already begun to ulcerate required from one to six weeks; periostitis was cured in from ten to twenty-four days; ostoses were not affected; syphilitic ulcers, consequent on the breaking down of gummatous periostitis, required treatment of from six weeks to three months or more; and necrosis of bone frequently required many months' treatment before the sequestra could be got away.—*Journal of Cutaneous and Genito-Urinary Diseases*, July, 1890.

ARISTOL.

Although aristol has been in the hands of the profession such a comparatively short time, an extensive series of publications of experience of its use has appeared, which, for the most part, quite confirms the very favorable results recorded by Eichhoff of its use. Dr. Brocq reports a remarkable case which he presented to the Société Médicale des Hôpitaux,—a patient suffering from extensive superficial epithelioma of the face, extending from the level of the mouth to the orbit, the lower eyelid being completely destroyed. The healing action in this case was at once evident, and in five or six days the wound was becoming covered with a firm cicatrix, and at the time the patient was presented to the Society, after use of the remedy for three weeks, only very small wounds remained. Dr. Brocq has also had most gratifying results in other cases in which he has used the drug, especially ulcers of the legs and ulcerated gummata.

Dr. Gaudin reports cases of psoriasis, ulcers, eczema, and chancre, in which he has used the drug with most excellent results; in one case of ulcer of the leg, in which he made comparative experiments with iodoform and hydrarg. biniod., the result with

aristol far exceeded that with the other drugs. In all his cases the marked property of the drug in favoring cicatrization was most striking. Dr. Gaudin applied the drug either dissolved in ether or collodion, or as a dusting powder.

Dr. Hughes has found the drug of much service in all those forms of rhinitis associated with a dryness of the mucous surface, or in which there is a tendency for the secretion to undergo decomposition. He reports twenty-one cases in which he has tried the remedy, and in all the result was most satisfactory; in two cases of specific ozæna the disappearance of the fetor and the healing was very rapid.

Dr. Löwenstein has treated four cases of ozæna with the drug, and reports most favorably on its effect in one case of specific ozæna. In addition to insufflation of the drug in powder, he painted the ulcerated parts with a solution in collodion flexile. He speaks very favorably of the property the drug has of forming a covering over the diseased surface.

Professor Neisser has made experiments on the action of aristol on bacteria, and also used it therapeutically in thirteen cases of lupus exulcerans, in which he found it of great service. In lichen rubra, soft chancre, and gonorrhœa the results were not satisfactory.

Dr. Schirren has treated ten cases of psoriasis of various forms, vulgaris, guttata nummularis, with aristol, and reports all the cases as cured after, at longest, twelve days' treatment. He applied the drug as ten per cent. ointment in lanolin or vaseline, or with zinc starch. In none of the cases was any ill by-effect observed.

Dr. Schuster records a case of syphilis of the naso-pharynx, in which he had a very good result, after the use of aristol in powder. The case had been under treatment for some months without any benefit, potassium iodide being administered internally and mercury by inunction. Dr. Schuster reports also a case of psoriasis in which he used aristol with very rapid and good results. He applied a ten per cent. solution of the drug in collodion flexile.

Dr. Seifert has made an extended trial of the new drug in the syphilis clinic at Würzburg, and reports very favorably on its use. He has used it in ulcers of the leg, lupus, psoriasis, moist condylomata, and suppurating gummata, and in all cases in which it was applied the good result was most marked. Dr. Seifert states that he did not find any iodine in the urine when aristol was administered internally.

Dr. Von Swiecicki has made a trial of the drug in gynæcological practice. He has used aristol in twenty cases, and in all the drug has had a beneficial action. The cases reported comprise endometritis, hyperplasia of the cervix, parametritis, eczema vulvæ, and, after operation for fissure of the cervix, applied as a dusting powder.—*Medical Chronicle*, July, 1890.

INTESTINAL CALCULUS FROM ABUSE OF VICHY WATER.

Dr. Loviot described, before the Paris Obstetrical and Gynæcological Society last autumn, a case where he discovered a scybalous mass in the pelvis of a woman, aged 32, who had been under his observation for over nine years. She suffered severely from constipation, and within five years spent two hundred and fifty francs in the purchase of Vichy water powder. Besides drinking the powder in solution daily she also took tamar, and administered to herself enemata. Defecation became very painful, leaving the sensation—not an illusion in her case—of a ball pressing on the perineum. Dr. Loviot succeeded in partially breaking down the mass by means of a blunt curette; then it was easily extracted through the anus without any laceration of the sphincter. The mass was as big as a small orange and very hard. The outer part consisted of dry fæcal matter, infiltrated with salts. In the interior was a white calculous mass of salts. M. A. Guérin, in discussing Dr. Loviot's case, spoke of another where severe diarrhœa was caused by the scybalous body. The mass itself was so hard that it had to be broken up by placing against it the end of an iron gouge, the handle of which was carefully struck by a mallet. With care the fragments were extracted without wounding the bowel or the anus. The diarrhœa immediately ceased.—*British Medical Journal*, June 21, 1890.

THE TREATMENT OF CYSTITIS IN WOMEN.

In gynæcological practice few diseases are more frequently before us, or are more intractable in their treatment by the routine methods usually recommended in text-books than cystitis. This complaint, moreover, often occasions, as Dr. Emmet has well ob-

served, an intensity of suffering hardly exceeded by any infirmity to which women are subject. A paper published by DR. THOMAS MORE MADDEN in the *Medical Press and Circular* for July 2, 1890, is therefore worthy of attention, especially since he claims that with one exception every one of the cases of this affection admitted into his wards were discharged free from the disease, although in some of these the disease had resisted years of previous treatment. In women cystitis is not only more frequent in its occurrence, from the greater number of the causes incidental to their sex just referred to, but is also more urgent in its symptoms, and liable to lead to graver pathological consequences than is the case with the same disease in men.

Cystitis is frequently met with either as a complication or a consequence of vulvar or vaginal inflammatory conditions,—*i.e.*, vulvitis or vaginitis,—more especially when of gonorrhœal origin. It may also be due to mechanical causes, uterine flexions and displacement, or fibro-myomata, or may be occasioned by the protracted pressure of the fœtal head in cases of difficult labor; occasionally it results from renal disease, or from the irritation of gravel or calculi, as well from cold, local injuries, or from reflex irritation, and still more frequently it arises merely from long delay in complying with the call to micturition.

The symptoms are pretty much the same in both cases,—constant, tearing suprapubic pain, extending through the pelvis, and giving rise to tenesmus, as well as almost constant desire night and day to pass water, with little or no relief; on each occasion micturition being attended with increased pain, straining, and inability to void the last drop of water. On examination of women with cystitis, the urethral orifice and canal were found patulous, the mucous membrane protruding in a state of hypertrophic ectropism through the gaping meatus, the lining membrane of the bladder was in a similarly diseased condition, and the organ itself so contracted and irritable that scarcely an ounce of bland fluid could be injected, and was immediately expelled with spasmodic force.

As regards the general treatment in the first place, it is obvious that in this, as in every other disease, the first point is to ascertain and remove, if it be removable, whatever may be the cause of the excited condition of the bladder. Thus, if this be dependent on extension of vulval or vaginal inflammation, gonorrhœal or non-specific, this must, in the first place, be allayed by appropriate treatment. If the cystitis be due to mechanical pressure of a displaced uterus, this must be rectified by a suitable pessary; in the same way a uterine fibroid pressing on the bladder, if it cannot be otherwise got rid of, must at least be pushed well above the pelvic brim. If a stone exist in the bladder, or if renal disease had extended from the kidneys down the ureters, the resulting cystitis cannot be subdued until the exciting cause in either case be removed.

The majority of the remedial measures recommended, Dr. Madden regards as merely palliative, such as long-continued hip baths, washing out the bladder with plain warm water with a double catheter, or else with flaxseed tea, or a solution of boro-glyceride concurrently in all cases, with absolute rest in bed, free use of diluents, and the internal use of the old-fashioned Dover's powder in small, frequently-repeated doses, together with boracic acid in 10- or 15-grain doses three or four times a day. None of these, however, may be expected to cure well-established cystitis, and Dr. Madden claims that there is no method of effecting this object excepting by giving the diseased endo-vesical mucous membrane, and, in cases of long standing, the equally diseased submucous walls, absolute rest.

This may now be secured in either of two ways. First, that advocated by Dr. Emmet, on the suggestion of the late Dr. Marion Sims,—namely, by the establishment of an artificial vesico-vaginal fistula, through which the urine may drain away as fast as secreted. In this way, by the removal of the irritation caused by its presence, and consequent continual stimulus on the hyperæsthetic endo-vesical structures, we may afford the patient a fair chance of escape from death from extension of the disease to the kidneys. The objections to this plan of treatment are, first, the common difficulty of keeping the artificial opening patulous sufficiently long to allow the diseased bladder to regain its normal condition; secondly, the irritation occasioned by the button commonly used for this purpose; and, thirdly, the more exceptional trouble which we meet in some cases of closing the fistulous opening when the desired object had been attained, and the consequent misery resulting from this mischance by which the patient's last condition would thereby be rendered still worse if anything than her former one.

For these reasons Dr. Madden has abandoned this operation, and believes that we may obtain all its advantages without any of its inconveniences, more effectually, more easily, and more safely, by simply so thoroughly dilating the urethral canal as to paralyze its contractility for a considerable time, and by repeating this procedure as often as may be necessary, and at the same time, in some exceptional cases, carefully curetting with a blunt wire curette the proliferating endo-vesical mucous membrane, or even without this, in most cases, by freely brushing it over with diluted carbolic acid until its morbid sensibility is thoroughly destroyed. The acid is best employed in the form of the glycerin of carbolic acid (B. P.), which is quite strong enough for the purpose, and is introduced on a saturated piece of Lawton's cotton by an ordinary holder, passed in through a dilator so as to avoid its being brushed off in the canal, and thoroughly applied to every part of the bladder, and retained for a few moments until the vesical membrane contracts firmly upon it. The application causes very little pain, but this may be prevented by first introducing in the canal a ten per cent. solution of cocaine. It seldom requires to be repeated more than a couple of times, at intervals of a week, to effect a cure of the most aggravated cystitis.

THE SUBCUTANEOUS INJECTION OF QUININE, WITH A CASE SHOWING THE UNUSUAL EFFECTS OF THE SAME.

At the meeting of the Italian Medical Society in October, 1889, Bacelli described the results he had obtained in cases of malaria, from the intravenous injection of a one per cent. neutral solution of quinine, to which a little chloride of sodium had been added.

Bacelli stated that only transitory effects were produced by the injection of .1 to .3 quinine, that by increasing the dose to .3 to .6 complete defervescence generally followed, and that in the severest cases it was necessary to inject 1.

Köbner contrasts these results with those obtained by himself. He used the same preparation of quinine, only in small doses, and injected subcutaneously instead of intravenously.

Köbner has practised the subcutaneous injections of quinine since 1870, and published some results in the "Memorabilia" (Heilbronn), 1880.

The method has been little taken up by others, and this he thinks is due to the use of solutions containing free acid, to the use of very slightly soluble irritating compounds, such as the formate, bisulphate, and lactate, or to the use of unsatisfactory substitutes for quinine, such as quinidine hydrochlorate.

The hydrochlorate of quinine is to be preferred on account of its greater solubility in water, and of its containing a larger proportion of the base. The solubility of the salt is much increased by heat and by the addition of glycerin. The solution should be injected lukewarm, and then gently rubbed into the areolar tissue.

Köbner prescribes the following for four injections:

> Quinine hydrochlor., .5 to 1;
> Glycer. pur,
> Aq. dest., āā 2;
> Disp. *sine acido!*

If kept long, a little distilled water must be added to make up for evaporation.

His most brilliant results were obtained in cases of intermittent neuralgia, the injections being always made in the back, except in cases of neuralgia of the fifth nerve, when the temporal region was often chosen. The dose in these cases ranged from .10 to .15 quinine hydrochlorate.

In cases of intermittent fever, Köbner recommended injections of .25, and, if necessary, two or three such injections at the same time at different points of puncture. This method he has practised with gratifying results, and without the production of local inflammation.

Dr. Richard Kohn has extended the use of these injections to cases of chronic mental disease. He finds that acute exacerbations in these cases can be cut short or prevented by the subcutaneous injection of the above formula, giving .8 quinine in four punctures. Only tinnitus aurium was complained of; no nausea; no abscess.

Köbner describes the case of a little boy, aged 4½ years, who exhibited a most remarkable idiosyncrasy to the action of quinine. The child was extremely delicate, with a white, almost transparent skin. He suffered from nervous irritability and sleeplessness, and for fifteen months had been greatly troubled by urticaria. Three years previously, during an attack of typhoid fever, a few small doses of quinine (.05) administered by the mouth had produced vomiting, extreme pallor, and dulness of

hearing. He was now given a subcutaneous injection of quinine (.3). Two hours afterwards three or four spots of purpura appeared on the chest, then others on the abdomen and thighs; next followed colic and hemorrhage from the anus. Five days later the injection was repeated with the same result.

This boy exhibited in marked degree the anæmia and irritability, especially of the skin, which always characterize those individuals who are predisposed to the ordinary symptoms of quinine intoxication.

Köbner warns us, therefore, that since such serious symptoms may possibly attend the subcutaneous injection of quinine, the chance of their appearance will be greatly increased by the large doses and intravenous method of Bacelli.—*Medical Chronicle*, July, 1890.

Reviews.

FACT AND THEORY PAPERS, No. 1. THE SUPPRESSION OF CONSUMPTION. By G. W. Hambleton, M.D., President of Polytechnic Physical Development Society of Great Britain.

New York: N. D. C. Hodges, 47 Lafayette Place, 1890.

Fact and theory gives one a wide range. The two cover everything worth having, but associated together make strange companions. Every theory is framed to account for facts, or their counterfeits. Every fact does duty, sooner or later, as one of the pillars of a theory; and in the somewhat strange architecture of theory the same fact may be one of the main supports of many theories, more or less antagonistic to each other and every other. The inhabitants of our globe die with tubercular disease. This is the grand fact. But the theories based upon this widespread mortality—in the effort to account for it—are in number legion. The author of the paper has his theory, and considers the others one by one, and demolishes them. The bacillus dies hard, but even it dies,—in the author's opinion. And there remains—still in the author's opinion—his own triumphant theory,—that tuberculous disease is due to a want of proper expansion of the thorax, and to a want of pure and proper air with which to expand it. This theory the author, with becoming modesty, has allowed, so far as we can judge from a somewhat hasty perusal of the paper, the reader to consider as especially his, the author's, own invention and discovery. It seems old and worn; it seems almost like part of the common stock of medical knowledge. Other observers have worked this line, he admits, for he refers to their labors, but still he springs it upon the reader as a startling novelty. Any one can get good chest expansion at will. The children of consumptive parents, he tells us, are born with as capacious chests as other children. He gives us a table of adult measurements, showing how we all ought to expand from six to seven inches between minimum and maximum. This seems a good deal. Much more than the life insurance examiners seem to expect. But the most curious statement in the book is the author's account of how he experimented in producing phthisis by limiting the expansion of the thorax, and probably by vitiating the air,—inspired in a previously healthy subject,—developing, he tells us, all the physical signs of the disease, and then—with how much haste and trepidation, with how much self-reproach and anxiety, he does not tells us—restored the patient by his own patent method of chest expansion. We know he was glad when the patient recovered, and we read between the lines that he has not repeated that experiment. How much it proved, and how much the whole paper proves, we leave to the curious reader to decide. E. W. W.

A TEXT-BOOK ON DISEASES OF THE EYE. By Henry D. Noyes, A.M., M.D. 733 pages.

New York: Wm. Wood & Co.

In attempting a review of this extensive and excellent treatise on the diseases of the eye, it is possible only to allude to its most salient features, and touch briefly upon the author's methods.

The work, as might have been expected at the hands of the author, is intensely practical and bristling with his own personality on every page.

It is divided into two parts. In Part I. the anatomy and physiology of the eye and its functional disorders are considered, to which two hundred and eight of the seven hundred and thirty-three pages are devoted. In Part II. the "inflammations and organic textural changes" are treated.

The style of writing is terse, clear, and directly to the point in hand. It is very difficult for one familiar with the subject to decide how far this will be satisfactory to the student who shall take up this book as his first text-book in ophthalmology. The short, crisp sentences make a most admirable review

of the present state of our knowledge, but we feel sure that the student will constantly be left in the fog for want of a fuller statement and more thorough illustration of very many important details. We do not mean by this that there are important omissions, but, in reading the condensed statements, one is left with the impression that the author had not time to be a teacher, but that his design was rather to furnish a treatise which should bear the scrutiny of his *confrères* in ophthalmology; that he would not weary them by the presentation of details with which they, like himself, were thoroughly familiar. If such were his design, he has certainly succeeded, for we have rarely read a book in which so much material has been solidly crowded into brief paragraphs and chapters, or where, with so much of the author's own personality, so little objection can be made, because of any want of accord, with a general consensus of opinion.

This characteristic of the book will be felt most in its first part, for the student has greater difficulty in grappling with the functional derangements of the eyes than with its pathological states, since the latter lend themselves, for the most part, to much readier clinical study than do the former, so that we cannot but regret that fuller explanation had not been given with the really admirable, though so condensed, statement of the functional disorders of the eye. In Part I. this objection, if indeed it can be regarded as an objection, disappears, and one reads with unflagging satisfaction the clear descriptions of disease, the latest views of pathology, and, above all, the treatment by a wise therapeutist and a conservative and skilful surgeon.

The entire treatise is pervaded by the spirit of an extended experience. It is constantly evident that the pen is wielded by one who has seen and is familiar with the things of which he writes. But rarely does an author so successfully convey to his printed page both the spirit of investigation which characterizes the laboratory, and the more homely but still fascinating work of the clinic or consulting-room. Where all is so good, it seems unnecessary to enter into any detailed analysis of its numerous chapters, or to select here and there subjects for special comment and criticism.

It gives us pleasure, therefore, to commend this book to every one desiring to know the present state of ophthalmology.

S. D. R.

LECTURES ON MASSAGE AND ELECTRICITY IN THE TREATMENT OF DISEASE. By Thomas Stretch Dowse, M.D., etc.
Bristol: John Wright & Co.
London: Hamilton, Adams & Co., Paternoster Row.

These lectures form an excellent treatise for those in the profession desirous of becoming more practically acquainted with a branch of medicine ever useful and of growing importance. To learn the art of massage perhaps practical instruction is absolutely needed; but, so far as this can be substituted by didactic instruction, with diagrammatic assistance, Dr. Dowse's book does so. The whole question of when massage does good and when harm, how it acts, and the allied subject of feeding, are discoursed on agreeably, pointedly, and impressively. While dedicating his book to Dr. S. Weir Mitchell, the author is a profound admirer rather than a servile follower. He thinks that experience in the method has taught him some things hitherto unrecognized even by the master mind, but he is modest in asserting, while firm in his beliefs. How massage is not taught the reader will discover in these pages, when Dr. Dowse reproduces the advice to his class given by a celebrated physician,—advice which is in every respect dangerous and wrong. It is no wonder that the method of rest and massage pursued in a totally erroneous way should fail in good results.

The principal value of Dr. Dowse's work lies in the careful analysis he makes in regard to what cases are unfitted for the rest-cure. Also in regard to diet, he gives us some rules by which we may avoid the error of indiscriminate and improper feeding. The cases given throughout the book are narrated in that graphic style which only an Englishman seems capable of attaining. The illustrations are profuse, and really give one an idea of the method of procedure in true massage.

E. W. W.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY. Vol. II., October 7, 1887, to May 17, 1889. Founded October 7, 1882.

These articles are evidently the selected product of several years of work, and the editors did wisely in their selection. From beginning to end, from the president's address to the index, the papers are good and worthy of publication. Among them are "Some Observations on Lactation," by Dr. Geo. Wythe Cook; "Phlegmasia Alba Dolens," by Dr. Chas. E. Hagner; Dr. John T. Winter's paper

on "Croup;" a paper on "The Physical Evils resulting from the Prevention of Conception," by Dr. Thos. E. McArdle, which will be viewed in as many lights by medical readers as it seemed to be in the appended discussion; one, by Dr. A. F. A. King, on "What is the Normal Posture for a Parturient Woman?" which strongly recalls Dr. Englemann's paper on the same subject in the *Transactions of the American Gynæcological Society* some years ago. Dr. King's paper, while by no means wanting in original thought, necessarily travels the already beaten track. There are a number of papers recording each a few interesting cases, one of extra-uterine pregnancy, one of pelvic hæmatocele, and "three cases of diphtheria in which papoid was used." Dr. G. Wythe Cook's paper on the subject of "Maternal Impressions, and their Effect on the Fœtus," leaves the reader in the same uncertainty as it finds him. The publication ends with a paper on "Uterine Fibroid," by Dr. D. W. Prentiss. All these papers show the sign of good, thorough, and conscientious work, and the discussions are especially readable.

E. W. W.

HYGIENE OF CHILDHOOD. SUGGESTIONS FOR THE CARE OF CHILDREN AFTER THE PERIOD OF INFANCY TO THE COMPLETION OF PUBERTY. By Francis H. Rankin, M.D.

New York: D. Appleton & Co., 1890.

If we could only have grown up under the supervision of some such manual as this, how much better we might have been, how much happier, and how much more we might have achieved. For the manuals of a generation ago or longer one must search a long time, and when successful in our quest, how strangely reads much of the advice, how trivial, and often how ill judged, if judged by the light of the science of to-day. But with Dr. Rankin's book in hand how boldly and confidently may almost any one enter upon the task of bringing up a family. Do doubts enter in regard to food or drink or exercise, study its pages, and they are solved. In short, a most excellent work, and one calculated to bring up many a weakling, make it forego its natural instincts, and live by sound science. But for the rough and tough children, the children who are hard to repress, who eat what they want, or try to, who get exercise whether pre- or proscribed, we doubt whether these, the really useful citizens of the future, will be any better for being cut and pruned. Their forefathers and mothers got along without manuals, and seldom asked or were told how many times a day they could eat meat, or knew whether the craving for acid fruits was normal and beneficial, or the reverse. They did get green apples long before science discovered that "the vegetable acids assist digestion."

E. W. W.

THE ANATOMY OF THE CENTRAL NERVOUS ORGANS IN HEALTH AND DISEASE. By Dr. Heinrich Obersteiner, Professor at the University of Vienna. Translated, with annotations and additions, by Alex. Hill, M.A., M.D., M.R.C.S.

Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1890.

This brochure contains within its covers four hundred and thirty-two pages occupied with clear type of good size, and nearly two hundred wood-cuts of fairly good quality; some of these cuts are diagrammatic, a very large proportion of them are microscopic. The treatise of Professor Obersteiner has been nearly three years before the profession in its original German dress. Nervous anatomy is, however, a subject in itself of extreme difficulty; while the German language seems to lend itself only in a sour, crabbed sort of way to the needs of medical science; at least it is certain that while French works on medicine are usually much easier read than French literary books, German medical books are much harder than the original German prose, and usually require much digging and quarrying on the part of the foreigner, even when his knowledge of the barbarous German tongue is good. There are, therefore, very few English-speaking doctors who, having reason to study the works of Obersteiner, will not thank Dr. Hill for his having dressed up this scientific child in a costume of modern English. Some how or other, when such a child is stripped of its original garb, bits of it are too prone to stick to it here and there, and strangely alter the new costume, and so a sort of German-English results. Dr. Hill speaks in his preface to the English edition of his efforts to prevent this; usually he is successful, but one still notices some remaining shreds. Witness the following sentence in the translation to the preface of the German edition: "Nay more, regions which seem to stand far enough away from nerve-pathology—ophthalmology, osteology, and even dermatology—have come to feel the need of a fundamental orientation of the central nervous organs." "Fundamental orientation" is a euphonious morsel, which would roll well under the tongue of even the great

Johnson; exactly what it means we confess we do not know.

The subject of the work is so far away from the branch of medicine to which the THERAPEUTIC GAZETTE is devoted that an elaborate review of the book would be out of place. Suffice it to say, that it seems to us to constitute the most minute drawing-up of the facts which we have in the English language upon anatomy and histology; that we also feel thankful that the author has stuck to his subject, and has not, as is so often done, attempted to make a treatise upon something else than is indicated by the title of the book.

An exceedingly valuable feature of the translation is what is known as the "Glossarial Index," in which the German names of the various portions of the nervous system, with their Latin and French equivalents, are given. This glossary does not seem to be complete, but contains enough in it to be very useful.

A HAND-BOOK OF OBSTETRICAL NURSING FOR NURSES, STUDENTS, AND MOTHERS, COMPRISING THE COURSE OF INSTRUCTION IN OBSTETRICAL NURSING GIVEN TO THE PUPILS OF THE TRAINING SCHOOL FOR NURSES CONNECTED WITH THE WOMAN'S HOSPITAL OF PHILADELPHIA. By Anna M. Fullerton, M.D., etc.
Philadelphia: P. Blakiston, Son & Co., 1890.

Were works of this kind accessible, one might say that the present volume was not imperatively needed, but with the appalling dearth of all such books, Dr. Fullerton has rendered a service to the community at large which nothing but a perusal of her work can ever repay. The "Hand-Book" is very good, very sound, and clearly expressed, and while principally of use to the students of the institution, for which it was evidently primarily written, may be perused and even studied by others with benefit. The marginal indices are of some assistance, and the work is creditable in appearance. E. W. W.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX. Eighth year, 1890.
New York: E. B. Treat & Co.
London: 31 and 32 Paternoster Row.
Chicago: 199 Clark Street. Price, $2.75.

The title-page reads as above. The cover calls itself the "International Medical Annual." But it is the same old "Annual," whose value in preceding years the reviewer has lauded. This year there is perhaps less actually new valuable matter, but if such is the case, the editors are scarcely at fault. We must blame the "lagging footsteps of the year." We have, as a body, perhaps, diverged too much from the beaten path of discovery in general to that of discovery in a few favorite fields.

There is little change in the arrangement of the book. Its topics are still arranged alphabetically, and divided into new remedies and new treatments, but there has been some effort made at padding the work into a larger size. In the new treatments "Thermo-Therapeutics" occupies all the space it deserves; and throughout the work what should be new is oftentimes quite ancient in flavor. But still there is plenty of reading new and instructive to be found in its pages, and we still commend it, though its guise be new and its shape rather more clumsy, which is a great mistake, since the previous volumes were not too large for a capacious pocket.

E. W. W.

HOW TO EXAMINE FOR LIFE INSURANCE. By John M. Keating, M.D., President of the Association of Life Insurance Medical Directors.
Philadelphia: P. Blakiston, Son & Co., 1890.

Dr. Keating has added one more to the number of text-books for the life insurance examiner. The book is carefully written, and contains within it the advice of the various companies of reputation to their examiners. Reading the advice, and imagining all examiners to strictly follow the letter of their instructions, the thought presents itself forcibly to the mind that while many might be called,—*i.e.*, "roped in,"—few, indeed, would be chosen, and that companies would be smaller in the number of insured lives, but sounder, and with losses only experienced in old age and fatal accidents. The risks that come up to this ideal standard are, indeed, few. But how few examiners live up to the standard they themselves alone know, and doubtless seldom acknowledge. The work is excellently illustrated, both in the department of physical diagnosis and in that of urinary analysis. E. W. W.

FLUSHING AND MORBID BLUSHING; THEIR PATHOLOGICAL TREATMENT. By Harry Campbell, M.D., B.S., Lond., etc.
London: H. K. Lewis, 1890.

The unique and picturesque title of this book will at once attract the reader. It is agreeably bound and printed, and is illustrated sufficiently for the author's purpose. Morbid blushing, the author thinks, comes from excessive self-consciousness, and he believes that he has successfully established

the rationale of the process. The study of nerve relations into which he enters is thorough and apparently satisfactory, and the portion of the work in which he treats of the remedies for this condition is full of practical interest. The author is quite a polypharmacist, and gives us formulæ, at the length of which the average medical man would surely blush, not morbidly, if detected in the act of writing them. Still, without trial, who can say that chloride of ammonium, ext. tarax. liquid., decoct. aloes co., infus. gent. co., sod. potas. tart., and tinct. lavend. co., all in combination, may not ameliorate or prevent blushing of dyspeptic origin. In the most serious cases, believing that abnormal nerve weakness is the cause, he recommends the "Weir Mitchell treatment" in its entirety.

E. W. W.

SAUNDERS'S QUESTION COMPENDS, No. 6. ESSENTIALS OF PATHOLOGY AND MORBID ANATOMY. By C. E. Armand Semple, B.A. Cantab., L.S.A., M.R.C.P. Lond., etc. With forty six illustrations.
Philadelphia: W. B. Saunders.
London: Henry Renshaw.
Melbourne: Geo. Robertson & Co., 1890.

For a short cut to the vital facts of pathology and morbid anatomy the book before us furnishes perhaps the best road accessible. Quite up to the most recent researches, with a careful chapter on bacteriology, and with every subject treated in the most concise manner, the facts to be impressed on the mind of the reader stand out with clearness and precision. Where a larger and more pretentious book might go unread, any one can find time at odd moments to acquaint himself with the contents of these pages. The book can be carried in the pocket, and the type, though small, is clear and admirable.

E. W. W.

A TEXT-BOOK OF OBSTETRICS, INCLUDING THE PATHOLOGY AND THERAPEUTICS OF THE PUERPERAL STATE. DESIGNED FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By Dr. F. Winckel. Translated from the first German edition, with the permission of the author, under the supervision of J. Clifton Edgar, A.M., M.D. One hundred and ninety illustrations.
Philadelphia: P. Blakiston, Son & Co., 1890.

There is an immense amount of material in this book. Of course much of it is old and trite, but even this is presented in novel form, from the stand-point of a writer whose surroundings are different from ours. The book goes deeper, too, into many questions than the general midwifery text-book, which so frequently makes its appearance among us. And besides the old, tried, and trusted facts which we can glean from every source, Dr. Winckel has given us much new material, not in any one place, but disseminated throughout the work. The addition to the obstetric department, of one relating to the pathology and treatment of the puerperal state, adds much to the value of the book; and, in the matter of illustrations, nothing but praise can be awarded, both for excellency and originality.

E. W. W.

Correspondence.

BERLIN.

(From our Special Correspondent.)

Professor Thomas Gluck has been elected director of the surgical department of the children's division of the Kaiser and Kaiserin Friedrich's Hospital. Though already filling several positions connected with surgery, his application was, nevertheless, in this instance, preferred to that of several other candidates. Professor Gluck has recently communicated to the Surgical Congress, as well as to the Berlin Medical and Free Surgical Associations, many discoveries in regard to a subject upon which he has been busy fifteen years, having begun to work upon it while he was yet an assistant to Bernhard, of Langenbeck. The subject of these communications is the plastic renewal of the different parts of the human body. Recently it has been more particularly the bones and joints to which Gluck has confined his attention; and it must be confessed that the idea of this reparative process is both highly ingenious, and that, moreover, its final results, as regards the preservation of the function of the parts concerned, have proved so eminently satisfactory that it is to be earnestly hoped that the method will soon find a wider field for application in the alleviation of human suffering. By it two widely different, but highly important, objects are obtained. The long bones of the skeleton show, under antiseptic precautions, an almost unbounded capacity of union between their smooth ends, whether of organic or inorganic nature. This fact led, in the clinic and experimenting-room, to fixing in juxtaposition the broken fragments of bone, in accordance with the invagination method; this plan of union can be resorted to in false joints, fractures, and osteotomies for the correction of deformities,

taking care, as far as possible, to fit the smaller into the larger end of the bone, and reinforcing the result with ivory pegs, extending from one fragment to the other. The bones, thus united with the pegs, form at first a kind of hinge-joint, which, being long held in an immovable position, may attain perfect rigidity; or which method, when applied to joints after their resection, may retain, to an extent, the mobility of the articulation. There is scarcely any possibility of the absorption of the implanted pieces of ivory, because masses weighing as much as two hundred grammes have been safely introduced, as well as such materials as glass, etc.

Moreover, Professor Gluck has made a cement to unite the smooth or rough ends of bones to each other. The serrations are touched with the thermo-cautery at a white heat, and the cement, being spread upon the opposed surfaces, the two ends are then united as quickly as possible. This cement becomes as hard as glass in about two and a half minutes after cooling. Moreover, it can be used not only as a method of uniting bones, but also for packing cavities in them, and it is thus possible to cement a foreign body into the substance of a bone with perfect safety. If later on this antiseptic cement forms a hard ring at the point of union, it will behave just like any other trivial osseous enlargement, but with this fundamental distinction, that it is called upon to play an important part in definitely contributing towards forming the fixidity of the would-be joint, and also that this immobility is obtained in a careful and systematic manner. In fourteen cases of joint-disease, in which resection was indicated, Professor Gluck has, as a rule, resorted to this method by invagination. In each instance the apparatus has been rendered antiseptic, and recovery has been obtained without inflammation. We have, moreover, to mention in these cases the absolute freedom from pus in the parts concerned, under antiseptic treatment; the perfect immobility of the union; the immediate recovery of the original length, as well as the nearly natural subsequent growth of the limb, which is always so desirable in orthopædic operations. In addition to the safe union of such foreign bodies, as the ends of different bones, this method allows every conceivable mode of treatment and the use of any apparatus, as well as its own applicability to troubles in all parts of the body, whether resulting from diseases of the osseous system, dislocations, or united fractures.

The chair of mental and nervous diseases in the medical faculty of the University, made vacant by the decease of Professor Westphal, and also the professorship of mental and nervous diseases in the Royal Charity Hospital, have been recently filled by the election of Professor Jolly, of Strasburg. In the mean time, the management of both these clinical departments of the hospital, as well as the duty of delivering lectures, has devolved upon the late professor's assistants in their two respective branches,—viz., upon Dr. Oppenheim in the department of nervous diseases, and upon Dr. Liemerling in that of mental diseases. For awhile the report was circulated that the chair would be discontinued, so that a department of psychology and neurology might be instituted; several men were thought of and their names discussed in connection with it. Now, however, the vacancy has been filled, and filled, too, in a manner that reflects credit upon our faculty.

The fact that the selection of new methods is a matter upon which no one can exercise too much care is so well known that I need offer no apology for my action in the present instance. Still I must here—according to authentic records—abridge what I wrote in my last letter; for I also have been too enthusiastic in my praise of tyoktanin, the new antiseptic. According to repeated and confirmed reports, it has become established that the results obtained with it in the treatment of wounds, while excellent, do not differ materially from those obtained by other modes of antiseptic treatment.

There has also arisen a mistake, which, at all events, is worthy of mention, and which might become detrimental to the universal introduction of the aniline preparations; and this is the intense coloring of the skin surrounding the wound that is exposed to violet rays of the spectrum. While we may, when using the non-coloring agents as dressings, well mark and outline the extent of inflammation around a wound, it is not possible to preserve this advantage when we resort to the use of tyoktanin, as it stains everything a similar dark-violet color. The extent, however, of the processes of infiltration, etc., may be outlined by the physician through the rather stronger staining by the violet rays upon the affected tissues; and as a knowledge of the extent of the disease has been considered rather detrimental to the patient

himself, the power of preventing it cannot be anything but in favor of the preparation which does so.

Opinions in regard to aristol seem favorable. So far reports of the results obtained by the trial of the preparation in all countries are uniformly encouraging, and it is, perhaps, possible that aristol, while nothing is yet permanently decided about it *pro* or *con*, may be winning for itself a lasting place among drugs.

Finally, I have to mention a few things in regard to the International Congress. When these lines reach you our welcome guests will be already among us. Still, as not all our colleagues can accept our invitation, I shall append a few notes about the manner of conducting the approaching festivities. In the first place there have arrangements been made for holding an evening of welcome; for the next day a dinner in the Berlin senate-house has been announced. Next comes the Berlin representation, and then the dinner of classification takes place. Next, his majesty has determined to invite four hundred members of the Congress to Pottsdam, and on Saturday there have been arrangements made for the final dinner in the rooms of Kroll's establishment, which feast is given by the medical profession of Germany.

In conclusion, let us all most fervently unite in hoping for the highest success of the Tenth International Medical Congress in the capital of the German empire.

BERLIN, July 17, 1890.

A RARE COMPLICATION OF WHOOPING-COUGH.

To the Editor of the THERAPEUTIC GAZETTE:

DEAR SIR:—An epidemic of measles has been giving the doctors in this vicinity a vast amount of trouble for the past two or three weeks. It has been very much more malignant than is usual with measles, and pulmonary complications have been the rule. A few weeks since I was called to attend a boy, 7 or 8 years of age, who had been taken with the disease a week before, and was then suffering from a severe attack of bronchopneumonia, superinduced by the measles; and, to add still further to the gravity of the case, he had, a few days before, begun to show symptoms of pertussis, and that disease was now fully developed. The eruption of measles had almost entirely disappeared, but his temperature was 104°, pulse 140, and there were coarse mucous râles all over both lungs. He was coughing almost continuously, expectorating freely a thick, yellow, somewhat tenacious sputum. At intervals, of perhaps an hour, he would have the most terrible paroxysms of coughing, at which times there would be the characteristic whoop of pertussis. He was put upon appropriate treatment, and the case progressed without any especially untoward symptoms until the third day after my first visit. At about ten o'clock on the morning of that day he was seized with a more than usually severe paroxysm of coughing, and, after he had become quiet, his nurse noticed a puffy swelling making its appearance in the region of the parotid gland, which increased rapidly in size and extended down upon the chest as low as the second rib. It also reached as high as the cheek-bone upon the right side, and stuck out prominently beneath the chin, exactly like a huge goitre. It was about two hours, according to the nurse's statement, from the time the swelling was first noticed until it had attained the size and appearance it presented at the time of my visit the next day. There was distinct fluctuation in the tumor, and, when pressed upon, it gave a peculiar rustling sound, similar to that produced by crushing soft paper in the hand. There was no discoloration or pain, and the tumor caused no inconvenience, except that due to its size. The extreme rapidity of its formation caused me to suspect the rupture of a blood-vessel in the region of the neck, and the extravasation of blood into the subcutaneous cellular tissue. I could not account for it on any other hypothesis, and therefore made no effort to evacuate the tumor. As stated above, it caused the patient no inconvenience whatever, but the complication of diseases from which he was suffering proved too much for his delicate constitution, and he died on the morning of the sixth day after its appearance. On the third day a slight reduction in size could be detected, and it gradually but rapidly dwindled until his death, when it had almost disappeared.

Now, the question is, Was I right in supposing it to contain blood, due to the rupture of a small vessel somewhere in the neck, or was it air? And, if the latter, how did it get there? The case was a decidedly unique one to me, as in a practice of ten years I had never seen or heard of anything just like it, and if there is a similar case recorded in medical literature, I have been unable to find

it after an extensive search. I would be glad to have your opinion, or that of some of your readers, as to the character of the tumor, its causation, and what would have been the probable results had I used the aspirator or attempted to evacuate with the lancet.

WALTER P. ELLIS, M.D.

LIVERMORE, KY.

[We have been entirely unable to solve the problem offered us by Dr. Ellis. At first it seemed that fuller details might perhaps serve to throw some light on the matter, and, as a result of the inquiry, the letters published below were received from Dr. Ellis. Aspiration with a hypodermic needle could have done no harm, and would probably have cleared the whole matter up. We have to confess, however, that no explanation of the nature of the tumor which is supported by the facts reported by Dr. Ellis occurs to us that is at all tenable. We have referred the matter to Dr. Louis Starr and other specialists, but without receiving any sufficient explanation of the nature of the case. We would be glad to receive any suggestions from our correspondents on this matter.—ED.]

LIVERMORE, KY., June 13, 1890.

ROBERT MEADE SMITH, M.D., PHILADELPHIA, PA.:

DEAR DOCTOR:—Your letter of the 9th inst., asking for further information concerning the case I reported recently, was received yesterday, and I hasten to respond to your queries *seriatim*. 1. The tumor was situated exactly on the median line, but extended a little higher up on the right side, which was due, as I thought, to the fact that he lay on his left side almost all the time. 2. The boy was one of a family of eleven, all boys, all living, and without indications of any constitutional taint whatever. 3. As to the measles proper, there was nothing peculiar about the case, except the bronchial symptoms developed early, and were unusually severe. He began whooping about the time the measles eruption disappeared. 4. There was some difficulty in swallowing solids at first, but that passed off in a day or two, and after that there was no trouble. 5. The respiration and cough were such as would be expected in a case of severe bronchial catarrh complicated with whooping-cough, before the appearance of the tumor, and there was no noticeable change in either afterwards. 6. I attributed his death to asthenia. The paroxysms of coughing were so very severe that he weakened rapidly, and it was a source of wonder to me that he did not succumb sooner than he did.

I wanted to use the hypodermic needle in order to determine the character of the contents, but the father objected so strongly that I was forced to abandon the idea. He was a very illiterate countryman, and my arguments could not overcome his dread of having an instrument of any kind used on his boy. The boy suffered no inconvenience from the tumor that I could discover, except that due to its size, and it gradually dwindled until his death, when it was about one fourth as large as at first. I have talked with several of my neighboring physicians, and they differ in their opinions as to the nature of the tumor. Some think it was simply an emphysema, while others think it may have been caused by the rupture of a blood-vessel, the blood collecting beneath the subcutaneous cellular tissue in that locality. The last is my own opinion. At any rate I have never seen or heard of anything just like it. Hoping this will enable you to throw some light on the case, I remain,

Very truly yours,

WALTER P. ELLIS.

LIVERMORE, KY., June 26, 1890.

ROBERT MEADE SMITH, M.D., PHILADELPHIA, PA.:

DEAR DOCTOR:—Your letter of the 23d inst. is at hand, and I hasten to respond. I was not aware of any inconsistencies in my communications, but probably I was not as clear or minute in describing the location of the tumor as I might have been. It began just beneath the chin, in the region of the *thyroid*, and extended over *both parotids*, a little higher on the right than on the left side. It filled all the space beneath the chin, and stuck out prominently, almost, but not quite, as large as a small fœtal head. It did not cause any change in the character of the respiration, which had been and continued to be after the appearance of the tumor, such as would be expected in a severe case of bronchitis complicated with pertussis. The dysphagia was slight, so slight, indeed, that I did not attach much importance to it, and was not noticeable after the first day or so. The pressure from the tumor all seemed to be outward, affecting the throat but little, if any, neither was there any appreciable change in the color of the face,—that is, there was neither increased pallor nor flushing. There

was sufficient fluctuation to cause me to think the contents might be fluid, but the crackling or rustling sensation spoken of in my report of the case was very distinct. I kept no notes of the case, but just report it from memory. I hope, however, that if the report was obscure this will make it plain.

I remain,

Very respectfully yours,

WALTER P. ELLIS.

THE SUBCUTANEOUS USE OF MORPHINE IN PUERPERAL CONVULSIONS.

To the Editor of the THERAPEUTIC GAZETTE:

DEAR SIR:—The article in your last November's issue on the various ways of treating eclampsia affords to my mind a striking instance of the slow progress of truth, and the constant liability to misrepresentation and mistake in practical therapeutics, that department of our art to which every other is merely subsidiary and preparative. Allusion is there made to myself as "one of the first to advocate the free use of hypodermic morphine in puerperal eclampsia;" in an article printed in the July number (1880) of the *American Journal of Obstetrics*, "which made considerable impression in this country," I am represented by your correspondent as advising "hypodermic injections of morphine, ¼ to ½ grain, frequently repeated, till, it may be, two or three grains were administered."

Now, had Dr. Hurd had my essay before him, he would have seen that I by no means originated, or claimed to originate, any such mode or measure of treatment for this fell disease. Morphine had been used in doses like those by various persons all over the country before my time. What I claimed in that article to have discovered, and endeavored to make certain by various arguments and illustrations, was that, in the state of the human system that permits or leads to an attack of eclampsia, there exists an exceeding tolerance of morphine, and that the dose of it to be administered must be proportionally large in order to be effective.

Accordingly, my instructions were that a patient attacked "with puerperal convulsions should have forthwith injected into her arm 1½ grains of morphine," and should the paroxysm return any time after two hours (when the medicine might be presumed to have exercised its full effect), "this dose should be repeated."

I will not now load your columns, Mr. Editor, with the somewhat thorough discussion of the subject there set before the public; but will content myself with saying that, whereas, when that article was written the members of our county medical society, including at least five-and-twenty practitioners of the first order of ability, to say nothing of more than as many others of the common sort, were utterly at sea on the subject of the treatment of this disease; some trusting to anæsthetics, about an equal number to bleeding, one of the most skilful among us to croton oil, and a few to "reasonable" doses of morphine, and though my alarming contention and advice were for a while stoutly disputed, yet now I know not of a single member of that society of any standing who ever thinks for a moment of using any other treatment of this fearful disease than that above recommended. Certainly there is not one, unless it be some pin-feather graduate of the schools.

Nor is this all. Not many years after the publication above referred to, I found, as the reason of the thing might well have taught me, that the same drug was by far the best of all known remedies for recurrent infantile convulsions, which piece of practical therapeutics I also made known to the profession through the columns of the same widely-read journal, but in what number I do not now recall nor can I easily ascertain.

Very truly yours,

C. C. P. CLARK, M.D.

OSWEGO, N. Y.

Notes and Queries.

RHINOSCLEROMA.

An excellent summary of this rare disease is given by WOLKOWITSCH in the *Centralblatt für Chirurgie*, No. 23, which will well repay perusal. This complaint was first described by Hebra in 1870. It is characterized by a hard swelling appearing in the nose and its neighborhood, by a very chronic course, and resistance to remedies. Cases have been recorded from all parts of Europe, but they have chiefly occurred in the eastern parts of Austria and the southwestern provinces of Russia; a few cases have also been observed in Central America. Wolkowitsch has collected seventy-six cases, in addition to eleven recorded by himself. The disease commences very insidiously. The most common site of

origin is the deeper parts of the nose, and occasionally the pharynx and larynx; in one case it started from the hard palate. Wherever it may have originated, the middle of the nose very seldom escapes, and the disease generally spreads to the following parts: the mucous membrane and subjacent tissues of the nares, the upper and lower lips, the tissues around the upper jaw, and occasionally even to the lachrymal tract and Eustachian tube. The progress is continuous and symmetrical. Of eighty-five cases, the mucous membrane of the nares was attacked in eighty-one, the cutaneous coverings of the nose in seventy-four, the pharynx in fifty-seven, the larynx in nineteen, the trachea in five, the upper lip in forty-six, the upper jaw in sixteen, the hard palate in seventeen, the tongue in four, the under lip in two, and the lachrymal tract in five cases; the ear was affected in one case only. The local changes consisted in the formation of small nodules, or sometimes plates, as hard as cartilage, some being diffuse and others sharply circumscribed. These usually had their origin in the deeper layers of the skin and mucous membrane. There was a considerable amount of brawny swelling around the nodules. A retrograde metamorphosis occurred in some cases, leaving hard and contracted fibrous tissue, so producing more or less distortion of the features and constriction of the upper respiratory passages. The nodules never broke down unless some complication occurred, or as the result of irrational anti-syphilitic treatment. The subjective symptoms were few. At the first there was usually an ordinary nasal catarrh; there was loss of smell, but the patient suffered very little pain throughout. Occasionally, however, fissures formed in the lips, producing considerable difficulty in speaking and eating. If the larynx or pharynx were much affected, dyspnœa was marked, often producing very serious symptoms. The disease was exceedingly chronic, lasting fifteen to twenty or even twenty-six years. The diagnosis from syphilis was often difficult. The only treatment of any avail was excision. A microscopical examination of the tissues was made in ten cases. The most marked histological features were a round-celled infiltration and a large amount of fibrous tissue, together with numerous larger cells, and the formation of small round spaces,—"vacuoles,"—due to hyaline degeneration of the large cells. The hair-follicles and sweat-glands were atrophied. Micro-organisms were always found. They, stained by Gram's method and morphologically, could not be distinguished from Friedländer's pneumococcus. They occurred in large numbers, and, from their constant occurrence, they seemed to bear an etiological relation to the disease, although inoculation experiments were unsuccessful.—*Lancet*, July 12, 1890.

THE odor of ichthyol may be disguised by oil of citronella. The latter is itself employed, in Ceylon, against rheumatism.—*Western Druggist*, July, 1890.

LANOLIN.

The great progress which has been made in all directions in which the manufacture of medicaments is involved has not been better illustrated than in the case of lanolin. Lanolin (Liebreich) now constitutes an unexceptionable product,—soft, free from odor, and nearly white.

What is commonly known as "lanolin" consists of true lanolin, with twenty-three per cent. of water added. Lanolin is the only perfect substitute for all ointment bases in officinal and in non-officinal preparations.

Its superior qualities may be summed up thus:

1. It never turns rancid.

2. It does not cause the slightest irritating effect on the most tender skin, and it rapidly penetrates the tissues, leaving no trace of fatty nature.

3. It can be mixed with any preparation of fats or oils, vaseline or paraffin. It can be incorporated with more than its own weight of water.

4. It is aseptic; no germs or microbes can live in it, as is the case with fats or oils.

The latter fact was proven by the researches of Dr. Gottstein (*Berliner Klin. Wochenschrift*, No. 48, 1887) and C. Frankel (*Centralblatt für Bacteriologie*, Bd. 1, No. 5, 1887), who compared lanolin with other ointment bases, such as culture media for microbes, and who found lanolin alone to be quite aseptic.

Lanolin in itself is of somewhat too sticky a nature to be used *per se*, but it may be used as an incomparable ointment base by the addition of vaseline or paraffin oil.

The best preparation is that of H. Helbing (*Chemist and Druggist*, April 27, 1890). It consists of—

Lanolin, 65 parts;
Paraffin oil, 30 parts;
Ceresin, 5 parts.

Or,

Lanolin, 65 parts;
Vaseline, 35 parts.

The superiority of lanolin over all other ointment bases is the reason that the new Pharmacopœias of Austria and Russia have adopted lanolin, and that the new Swiss Pharmacopœia will also adopt it.

The property of lanolin to mix easily with water was first instanced by the great authority in dermatology, Unna (*Therapeutische Monatshefte*, 1890, No. 2–4), in Hamburg, who called attention to its adaptability to the preparation of cooling ointments, which, in cases of inflammation, give excellent results, owing to the evaporation of the water contained in the lanolin.

Further, this property of lanolin is of importance in the treatment of the mucous membranes. Professor Frankel (*Berliner Klin. Wochenschrift*, No. 5, 1886), of Berlin, has used lanolin in the treatment of the mucous membranes of the nose and the pharynx with very favorable results.

This property of lanolin has caused Dr. Casper (*Berliner Klin. Wochenschrift*, No. 5, 1887) and Dr. Finger (*Wiener Medizinische Wochenschrift*, Nos. 46, 47, 1887) to use it with excellent results in the treatment of gonorrhœa in the form of an argent. nitr. ointment. The advantage of this treatment is that this ointment absorbs the secretion of the urethra and brings the medicament directly in contact with the mucous membranes of the same.

As to the second point, Dr. Lassar, dermatologist, of Berlin, and Professor Doyon, of Paris, have found that in over four hundred cases in which they used lanolin no irritation was ever produced.

Dr. Lassar (*Berliner Klin. Wochenschrift*, No. 5, 1887), Dr. Edm. Stern (*Deutsche Medicinische Wochenschrift*, No. 15, 1886), Dr. Shoemaker, Philadelphia (*Medical and Surgical Reporter*, 1886), Professor Smith, Dublin (*British Medical Journal*, June 12, 1886), Dr. Wende, Buffalo (*British Medical Journal*, February 13, 1886), Professor Campana, Genoa (*Bollet. della R. Academia di Genova*, 1886), Dr. Berend, Berlin (*British Medical Journal*) have found that psoriasis, pytiriasis, seborrhœa, impetigo, scabies, tinea favosa, herpes tonsurans, sycosis acne, tylosis, and eczemas are completely cured with lanolin ointments.

In cases of eczema in children, equally favorable results were obtained by Professor Widerhofer, Vienna (*Allg. Wiener Med. Ztg.*, 1886), and Dr. Walfsberg, Christiana (*Therapeutische Monatshefte*, March 5, 1887). The latter reports that he obtained in cases of pruritus and prurigo senilis by the use of lanolin ointment, without other medicaments, most remarkable results.

Geheimrath Mayer and Geheimrath Brandis, in Aix-la-Chapelle, have made thorough tests of lanolin with mercury ointment, and consider the lanolin superior to all other bases for this purpose. In no case did it show an indication to produce eczema. The same is reported by Professor Lang, of Vienna, and Dr. Frost, in their publications on the use of gray oil in syphilitic affections.

With all these properties it is not difficult to predict for lanolin a long career of great usefulness in dermatology, therapeutics, and the general hygiene of the skin.—*Medical World.*

ARISTOL is said to be an excellent application for piles, both external and internal.—*Western Druggist*, July, 1890.

AURAL AND CUTANEOUS COMPLICATIONS IN INFLUENZA.

According to the Vienna correspondent of the *British Medical Journal* (July 19, 1890), DR. A. EITELBERG, of Vienna, assistant to Professor Urbantschitsch at the Vienna General Poliklinik, writing (in the *Wiener Medizinische Presse*) of aural complications in influenza, states that during the recent epidemic in Vienna he had seen at least a hundred cases of such complications. Blood extravations over the different parts of the membrana tympani, from the size of a pin's point to that of considerable vesicles, were frequently met with. The tympanic membrane itself, and the mucous membrane of the tympanic cavity, were very often hyperæmic. He had frequently seen severe hemorrhages from the ear as the result of those conditions, and he is even inclined to consider these severe and continual hemorrhages as a characteristic symptom of the tympanitis of influenza. Dr. Eitelberg points out that, in spite of the severity of the symptoms (the patients often being unable to sleep for several nights owing to agonizing pains shooting through to the head and sometimes towards the shoulder), the course of the affection was,

as a rule, exceedingly favorable, and ended in complete recovery in a relatively short time.

Professor Urbantschitsch told him that among his own numerous cases there was one of vegetation, in two cases the mastoid process was transiently affected, and in two others deafness remained behind for a certain time after the inflammation had run its course. Tenderness over the mastoid was observed in nearly every case. This, however, soon disappeared, except in one case in which the mastoid region had to be submitted to direct treatment. Otitis externa was a much more disagreeable complication, owing to the intensity of pain. Pledgets of cotton-wool steeped in a five per cent. solution of carbolic acid and glycerin were of service in such cases.

Dr. Eitelberg cites some cases in illustration of the rapid subsidence of inflammations of the middle ear; among them may be mentioned the following: A woman, aged 40, became affected with bilateral purulent otitis media after an attack of influenza. The ear affection set in with fever and severe pain, which, starting from the ears, spread over the whole head, and reached as far as the arms. The auditory canals were washed with a weak lukewarm solution of common salt. After cleansing the parts with cotton-wool, the membrana tympani was found to be red and swollen on both sides. Perforation could not be detected at the first examination. Besides pain in the ears and headache the patients also had the sensations of throbbing and pulsations in the ears. There was no tinnitus. The tragus and mastoid process were very tender on pressure, and great deafness was present. The case was treated with pledgets of cotton-wool steeped in a five per cent. solution of carbolic acid and glycerin inserted in the external auditory canals, and by instillation of some drops of the same solution which were allowed to remain in the ear for five minutes. Lukewarm poultices were applied over both ears. At the next examination perforation of both tympanic membranes was found to have taken place. There was copious mucopurulent discharge. The same treatment was continued, but a four per cent. solution of boric acid was instilled after each washing out of the ear. In four days the discharge ceased, and in a week the hearing was normal. The perforations closed.

The average duration of the affection in these and the other cases was from eight to ten days. With regard to simple catarrh of the Eustachian tubes or tympanic cavity in connection with influenza, Dr. Eitelberg met with several cases in which the insufflation of air, according to Politzer's method, repeated two or three times, was sufficient to increase the hearing of whispers from one metre to from six to eight metres and upward.

In a recent number of the *Orvosi Hetilap*, Professor Schwimmer, of Buda-Pesth, expresses the belief that the streptococcus is the cause of the erythematous and erysipelatous skin affections met with in influenza. They might also occur, however, as reflex symptoms of internal affections. In St. Petersburg, extensive erythema was observed; in Paris, erythematous skin inflammations, and occasionally also papular eruptions; in Berlin and Vienna, erythema, herpes, and urticaria. Professor Schwimmer's own observations included, 1, herpes of the lips and alæ of the nose in one case; herpes iris and circinatus combined with erythema iris and circinatum in two cases; 2, erythema,—namely, three cases of erythema exsudativum multiforme in great number; in one case with subsequent desquamation; 3, urticaria in two cases, once in a man, aged 65, and once in a woman, aged 60; 4, measles in a child, aged 12, and in another, aged 14 years, after influenza, when no epidemic of measles was prevailing. In three cases (all women) psoriasis occurred. The chief characteristic of the affection, therefore, was that they were of angio-neurotic type.

OIL OF CINNAMON is claimed to be fatal to the typhoid microbe.—*Western Druggist*, July, 1890.

POTASSIUM TELLURATE IN THE NIGHT-SWEATS OF PHTHISIS.

In the *Wiener Klinische Wochenschrift* for June 5, DR. EDMUND NEUSSER relates his experience with potassium tellurate as a remedy for the night-sweats of consumptives. He used it in the form of a pill, giving at first .02 gramme (about a third of a grain) at a dose. In most of his cases this proved sufficient, but a few patients began to sweat again after a time, and with them he doubled the dose, generally with good results. In but few instances were any toxic effects observed, even with doses of a grain; it was only after their prolonged use that anything

of the kind occurred, and then the symptoms were only those of moderate disturbance of digestion. An objection to the employment of the remedy, however, is the fact that it imparts an intense garlicky odor to the breath, but generally this is not perceived by the patient, although two of the patients complained of a sulphurous or camphoraceous odor of the eructations.—*New York Medical Journal*, July 5, 1890.

ARISTOL IN OZÆNA.

Iodide of thymol—or aristol, as it is called—is strongly recommended by DR. LÖWENSTEIN, of Elberfeld, in ozæna. He gives in the *Internationale Klinische Rundschau* several cases in which this remedy proved more efficacious than any other. In one case, the patient, who had previously been treated with iodoform, would have been discharged from his employment on account of the smell of the drug; aristol was then employed with the most satisfactory results, the fetor vanishing, the ulcerations healing, and the scabby crusts ceasing to form. Dr. Löwenstein makes use of insufflations, which answer very well, as aristol is a fine powder. He also paints ulcerated spots with a mixture of 1 part of aristol in 10 parts of flexile collodion. It is necessary to keep aristol in a dark-glass bottle, as it is easily acted on by light. It may be remarked that it has a very slight but not unpleasant odor, and that it is remarkably cheap.—*Lancet*, July 5, 1890.

SANTONINOSSIME—A NEW ANTHELMINTIC.

According to PROFESSOR COPPOLA (*La France Médicale*, July 18, 1890) santonin, even in large quantities, does not kill ascarides, while on account of its solubility and the facility with which it enters into soluble combinations, it is readily absorbed by the gastro-intestinal mucous membrane, and produces more or less marked symptoms of poisoning. Santoninossime is a derivative of santonin, and is obtained by heating 5 parts of santonin with 4 parts of the hydrochlorate of hydroxylamin with 3 to 4 parts of lime in the presence of alcohol. The preparation occurs in needles, insoluble in cold water, soluble in boiling water, soluble in alcohol and acetic acid.

It is stated by Coppola to be only with difficulty absorbed, and may be given in two or three times the sized doses in which santonin is prescribed, while its therapeutic effect is very much more marked, and its administration is free from any attending disturbance. Its use after two or three days should be followed by a purgative.

GURJUN OIL is recommended as preferable to copaiba in chronic bronchitis.—*Western Druggist*, July, 1890.

FOOD PRESERVATIVES.

The use of preservatives for articles intended for food and drink is an important one, both for the manufacturer and the consumer. From a sanitary point of view, it is doubtful whether any of the preservatives ordinarily added to articles intended for human consumption ought to be encouraged. Laws exist in continental European countries prohibiting the use of certain of these preservative agents. Salicylic acid is prohibited by most of them, and the manufacturers are there beginning the use of benzoic acid, which is preservative in small amount and is not easy to detect. After a discussion at a convention of chemists at Speyer, Bavaria, on the 10th of September, 1888, the conclusion was reached that boric acid, as a preservative for foods, is to be regarded with caution. Sanitary authorities have generally spoken in stronger terms of the use of boric acid, and yet it enters into the composition of a large number of the preservatives in the market. Hirschsohn (*Chem. Ztg. Repertor.*, 1889, p. 46) gives a description of several different boro-glycerides which he recommends for preserving foods. Boro-glycerin is prepared by heating glycerin with boric acid, in the proportion of 124 of the former to 190 of the latter. He also recommends sodium, calcium, and magnesium glyceroborates. These compounds are mostly tasteless, and quite soluble in water and alcohol.

Magnesium borate is recommended as a remedy in throat affections.

A. R. Rosen recommends the following method for preserving meats: Boric acid or its salts are dissolved in water and the solution is then frozen. The article to be preserved is then covered with this ice, with the result that the meats are preserved after the ice melts.

Dr. E. Polenske (*Kaiserlich Gesundheitsamt*, 1889, p. 198) has made an examination of ten commercial preservatives intended for

meats. Three of the ten contained sulphurous acid or sulphites; two contained borax, and five boric acid; one each contained alum, arsenious oxide, salicylic acid, and free phosphoric acid; two contained glycerin, and two boro-glycerin; three contained nitre, and six common salt. The one containing arsenious acid (1⅔ grains per quart) was sold under the name of "Stuttgart Preserving Fluid for Meats." (Translated.)

This was the only one actively poisonous, but several of the others were decidedly objectionable. Indeed, we should object to the addition of anything to our meats which is not a natural ingredient of food or cannot be converted into a compound natural to the human body.—*Brooklyn Medical Journal*, August, 1890.

ARISTOL in suppositories is prescribed in 5- to 10-grain doses.—*Western Druggist*, July, 1890.

SUCCESSFUL REMOVAL OF A TUMOR IN THE BRAIN.

According to the Berlin correspondent of the *Lancet* (July 19, 1890), at a recent meeting of the Berlin Medical Society, DR. H. OPPENHEIM described an operation of this kind. The patient was a woman aged 36. She had enjoyed excellent health till last September, when she began to suffer from clonic spasms in the temporal region and in the left arm, and frequently fell into convulsions. On recovering consciousness she complained of pain in the right temporal region. The symptoms recurred, and a diminution of the sensibility of the left arm and side set in. The diagnosis pointed to a growth in the brain. As internal treatment only made the patient's condition worse, and the left foot also became rigid, the skull was opened on April 26, under antiseptic precautions, and the surgeons removed a tumor about the size of a crown-piece. The patient has felt decidedly better since the operation. She can move the left arm and foot without difficulty, and can walk about.

THE SOLUBILITY OF SANTONIN IN CASTOR OIL.

To obtain a solution of santonin in castor oil it is necessary that the santonin be reduced to the form of an extremely fine powder, and then be dissolved in the castor oil by the aid of heat in a water bath with continued agitation. It is difficult, however, to obtain solution even in hot castor oil up to three to four per cent., for, on cooling, even though solution may have been complete while warm, santonin deposits in the form of crystals. If, however, small quantities are employed, and the solution be no greater than one per cent., a clear preparation may be obtained by the aid of heat, in which no precipitation occurs even at the ordinary temperature within three or four days.—*Répertoire de Pharmacie*, July 10, 1890.

POISONOUS EFFECTS OF EXALGINE.

In the *British Medical Journal* for July 12, 1890, MR. H. F. SEMPLE reports the case of a lady, aged about 40, of hysterical temperament, who had been suffering from nervous headache monthly for the last ten or more years, and who had been treated with all kinds of drugs, but without avail. Recently Mr. Semple writes that he had been administering exalgine, giving 2 grains twice a day, which gave great relief. The attack, however, recurred the next month, and 2 grains every four hours had very little effect, so the dose was increased to 5 grains twice a day. The first dose was taken at 10 P.M., after supper, with great relief to the pain, and the patient slept till 6 A.M., when she awoke and felt headache coming on again, so took another dose and lay down. In about a quarter of an hour she jumped up with a sudden start and scream, and thought she was dying; she had such curious sensations, felt numb all over, fingers and toes mingled and felt dead; eyelids twitched continuously; the whole head felt as if it was swelled, and kept expanding and contracting alternately. There was great oppression in the region of the diaphragm. In a few minutes the patient vomited and ejected the remains of the medicine. She then felt much relieved, and lay down and slept, after taking a little tea. Two hours after, the patient got up, but felt ill; the headache was slighter, but not gone; the numbness of the fingers and toes remained nearly all day, but beyond this the patient was little the worse for her experience. She went out next day, but says she will be afraid to try the medicine again. Mr. Semple thinks that this so-called poisoning with exalgine is due to its being taken on an empty stomach, as the former dose was well borne when food was present, so he always orders it to be taken after a meal. He gives the drug dissolved in tinc-

tura aurantii and diluted. He has found it useful in toothache, facial neuralgia, and in a case of long-standing lumbago. No beneficial effect of the drug has been found from less than two grains for an adult.

TREATMENT OF SMALL-POX.

M. GALEWOUSKI, of Paris, reports that in the small-pox hospital at Brunn, in Austria, baths colored red with permanganate of potash are used for the treatment of small-pox. It is stated that after a short stay in the bath the temperature of the patient falls materially, his general health is improved, the pustules are resolved, and recovery sets in.—*Medical Press and Circular*, July 23, 1870.

THIOL (ammonium sulphothiolum), the successful rival of ichthyol, combined with collodium in the proportion of 1 to 20, has been found to give excellent results when applied to wounds. The durable, flexible pellicle acts as a protector, and favors granulation, while free from the objections of iodoform collodium.—*Western Druggist*, July, 1890.

MOLLITIES OSSIUM CURED BY OÖPHORECTOMY.

Zweifel has already proved that after a Porro's operation in a case of mollities, the bone disease, usually so intractable, may pass away. This result is not invariable after Porro's operation, and, when it occurs, it is apparently due to the removal of the ovaries. DR. H. FEHLING has recently noted the above facts in the *Centralblatt für Gynäkologie*. He quotes the favorable experience of Hoffa, P. Müller, and Winckel, and declares that in eight cases, where he himself has removed the appendages in cases of mollities, the results have been excellent. In six of these cases the patients had not borne a child for at least two years before operation, yet the disease was making active progress, and preventing the patient from working for her bread or enjoying life. In most of the cases the arrest of the mollities was very rapid, in the remainder improvement set in slowly, but continued steadily after operation. These results, in Dr. Fehling's opinion, appear to justify the theory that it is the suppression of the functions of the ovaries that brings about the cure of mollities after the extirpation of those organs. Why such a phenomenon should occur, Dr. Fehling does not explain; but, if his theory be correct, we have a new physiological truth of great importance. The bones, in respect to their red marrow, are known to be blood-organs; now, it appears that the ovaries are, at least under certain conditions, bone-controlling organs.—*British Medical Journal*, July 28, 1890.

ARECOLINE, the volatile liquid alkaloid of the areca-nut, principally affects the heart. It is excreted unchanged.—*Western Druggist*, July, 1890.

SALOL COLLODION.

It is recommended in the *Répertoire de Pharmacie* for July 10, 1890, to dissolve 4 parts of salol in 4 parts of ether, and then add to 30 parts of collodion, and it is stated that the application of the salol collodion to the affected parts in acute rheumatism will be followed by rapid relief of pain.

SOLVENTS FOR CAMPHOR.

According to SAZEAU, the addition to camphor of ether or alcohol increases the quantity which chloroform is capable of dissolving. To this Hoffer adds that olive oil saturated with camphor will dissolve six times as much as iodoform.—*Pharmaceutical Journal and Transactions*, June 28, 1890.

TABLE DENOTING THE NUMBER OF DROPS CONTAINED IN A GRAMME.

In view of the agitation in favor of the adoption of the metric system in pharmacology, and the certainty of its ultimate acceptance, the following table, showing the number of drops of various drugs contained in a gramme will, therefore, be of value:

Acid, acetic, dilute, 20.7.
Acid, bromhydric, 13.8.
Acid, carbolic, liquid, 27.4.
Acid, hydrochloric, 14.6.
Acid, lactic, 24.6.
Acid, nitric, 16.
Acid, phosphoric, 13.2.
Acid, sulphuric, dilute (1 : 5), 14 5
Alcohol, absolute, 39.8.
Alcohol, dilute, 30.1.
Alcohol, nitroso ether, 37.2.
Amyl, nitrite of, 41.4.
Bitter-almond water, 21.5.

Chlorine water, 14.9.
Chloroform, 35.5.
Creolin, 29.1.
Creosote, 26.2.
Ether, acetic, 40.8.
Ether, sulphuric, 51.3.
Ethylene, chloride of, 31.7.
Essence of eucalyptus, 33.7.
Essence of peppermint, 32.6.
Essence of turpentine, rectified, 33.7.
Extract of belladonna, solution of, 27.9.
Extract of cascara sagrada, fluid, 29.8.
Extract of hyosciamine, 33.8.
Oil of almonds, ethereal, 22.5.
Oil of cloves, 28.6.
Oil of croton, 30.8.
Oil of mustard, ethereal, 29.2.
Hypnone, acetophenone, 23.4.
Ichthyol, 30 2.
Mercury, peptonate of, 14.8.
Mercury, solution of formamide of, 13.
Paraldehyde, 36.7.
Quinoline, 21.6.
Solution of acetate of ammonium, 30.2.
Solution of ammonia, simple caustic, 15.5.
Solution of iron, acetate, 16.7.
Solution of iron, perchloride, 13.6.
Solution of iron, potassic arsenite, 18.8.
Solution of lead, subacetate, 13 5.
Tincture of aconite, 35.1.
Tincture of benzoin, 36.8.
Tincture of cascara sagrada, 29.6.
Tincture of castor canadensis, 36.2.
Tincture of colchicum, 35.1.
Tincture of digitalis, 34.
Tincture of hellebore, 32.7.
Tincture of iodine, 39.2.
Tincture of ipecac, 34.4.
Tincture of iron, acetate (ethereal), 28.3.
Tincture of iron, maltate, 19.6.
Tincture of musk, 29.6.
Tincture of nux vomica, 34.6.
Tincture of opium, benzoic, 33.4.
Tincture of opium, simple, 28.4.
Tincture of quebracho, 34.5.
Tincture of quinine, compound, 33.1.
Tincture of strophanthus, 34.8.
Tincture of valerian, 31.4.
Water, 13.6.
Wine of antimony, 29.6.
Wine of ipecac, 22.9.

—*Journal de Médecine de Paris*, June 22, 1890.

HYDRACETIN.

Dr. E. Basch has carried out some observations on the use of hydracetin in skin-diseases, and finds himself unable to agree at all fully with the laudatory accounts which have been given of its action by some other observers. He finds that it is decidedly poisonous, even when applied externally. In a case of general psoriasis, where a ten per cent. ointment was applied to a third of the surface of the body, after ten days' treatment the skin and mucous membranes became quite pale, and though the hydracetin was then stopped, hæmoglobinuria and jaundice supervened. The pulse became very rapid; but notwithstanding the constitutional action of the drug, the psoriasis was not benefited. Dr. Basch finds that hydracetin, though a powerful reducing agent, and useful in small patches and limited areas of psoriasis, has by no means the specific effect that pyrogallol and chrysarobin seem to possess.—*Lancet*, July 5, 1890.

DIOSCOREA VILLOSA.

In a letter to the *Medical Bulletin* for July, 1890, Dr. Thomas M. Woodson writes that examination of a remedy sold by a travelling irregular physician for the relief of biliary colic, which had proved to be remarkably successful for this purpose, showed that the principal constituent was dioscorea villosa, and on acting on this information Dr. Woodson writes that he has treated several cases of biliary colic with this remedy, and ordinarily with striking relief.

He appends the following formulæ for its use:

NO. 1.

℞ Subnitrate of bismuth, ʒiii;
Fluid ext. dioscorea villosa,
Camph. tr. opii, āā ʒss;
Tr. ginger, q.s. ad ʒiii.

Sig.—One teaspoonful every hour until relieved during paroxysms.

During the interim, to prevent the attacks, use—

NO. 2.

℞ Tr. ferri mur., ʒiiss;
Subnit. bismuth, ʒiv;
Fluid ext. dioscorea villosa, ʒiii;
Liquid pepsin, q.s. ad ʒiii.

Sig.—One teaspoonful after eating, three times a day.

Dr. Woodson adds that he has used the following with satisfaction in those cases of indigestion attended with pain, torpid bowels, etc., which we frequently encounter:

℞ Fluid ext. dioscorea villosa, ʒi;
Fluid ext. cascara sagrada, ʒss;
Tr. nux vomica, ʒii;
Fluid ext. taraxacum, q.s. ad ʒiv.

Sig.—One teaspoonful two or three times a day.

It would seem that the dioscorea is a valuable remedy in numerous cases of digestive troubles, and worthy of more extended use by the profession.